

**DIAGNOSTIC MAINTENANCE
ROUTINES
for**

**9400 SYSTEM
PROCESSOR
AND
CONSOLE**

PX 5692-0-1

UNIVAC

DATA PROCESSING DIVISION
Utica/Ilion, New York

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SECTION 1

GENERAL INFORMATION

1-1. INTRODUCTION. - This manual is used with the 9400 Diagnostic Maintenance Routines (DMR) to verify proper operation of the Univac 9400 Processor and to isolate, to the card level, malfunctions detected during the loading or subsequent execution of the DMR program. The programs and the manual are specifically designed for use on the Type 3019 Processor, Serial 201 and later, with a 24,576 expandable to 131,072 byte Type 7010 Storage and the following options:

- 1) Limits Register, F1091
- 2) Communications Adapter, F10193
- 3) Selector Channel 1, F1092-00
- 4) Selector Channel 2, F1092-01

With consideration for EIR changes, however, both the 9400 DMR program and the manual may be used effectively on Serial 101 through 200 Processors.

The program may be loaded from either a UNISERVO VIC Subsystem via the Multiplexer Channel, or a UNISERVO 12/16C Magnetic Tape Subsystem or Univac 8411 Disc File Subsystem via Selector Channel 1. The program is executed from the processor maintenance and operator panels and the console using the detailed procedures provided in Section 2. Malfunction detection is accomplished by a combination of the running program and visual observations; malfunction isolation and correction are accomplished by the procedures and data in Sections 3, 4 and 5.

1-2. MANUAL ORGANIZATION AND CONTENT. - The 9400 DMR manual is composed of six sections, as follows:

a. General Information. - This section contains a description of the DMR program and program philosophy, instructions on proper use of the manual, a list of required test equipment and tools, a list of related reference material, and a glossary of special terms used in the manual.

b. Operating Instructions. - This section contains detailed instructions for loading and executing the program, and procedures to follow in the event the computer stops, loops, or otherwise operates abnormally while the program is being loaded or run.

c. Load Failure Analysis. - This section contains detailed step-by-step instructions for isolating and correcting malfunctions that inhibit loading the 9400 DMR program.

d. Manual Tests. - This section contains detailed step-by-step instructions which enable the operator to manually isolate equipment malfunctions not detected by the running program.

e. SORT-IT Listing. - This section contains a computer-sorted list of error displays and corresponding card replacements. Detailed instructions on the proper use of this data are provided in paragraph 5-1, page 5-1.

f. Program Listings. - This section contains the side-by-side listings of the 9400 DMR source and object programs.

1-3. GUIDE TO PROPER USE OF MANUAL. - The uniqueness of the 9400 DMR program documentation makes it imperative that any potential use become thoroughly familiar with the items listed below before attempting to load or execute the DMR program, or to use this manual for malfunction isolation.

- 1) Program description and philosophy of diagnostic testing. (Refer to paragraph 1-4, page 1-2.)
- 2) Special terms used in the manual. (Refer to paragraph 1-7, page 1-
- 3) Test equipment and tools required for diagnostic testing. (Refer to paragraph 1-5, page 1-
- 4) Special purpose procedures and instructions. (Refer to paragraph 2-5, page 2-8.)
- 5) Description of SORT-IT listings. (Refer to paragraph 5-1, page 5-1.)
- 6) Sequence for performing diagnostic testing. (See below.)

After the user has become familiar with the above-mentioned items, the DMR program should be loaded and run (with all hardware option tests) on an operational system according to the procedures in Section 2. This aids the user in recognizing malfunctions and in differentiating between various types of malfunctions when they occur under actual test conditions.

The recommended procedure for performing diagnostic testing on the 9400 Processor is as follows:

- 1) Ensure that loading device is operational.
- 2) Perform pre-load checkout procedure detailed in paragraph 2-2, page 2-1.
- 3) If the pre-load checkout procedure is successful, load the DMR program according to the procedure detailed in paragraph 2-3, page 2-2.
- 4) If the program loads successfully, execute the program according to the procedure detailed in paragraph 2-4, page 2-4.

If the program runs to successful completion, indicating the processor is operational, testing is completed. If a malfunction is detected while performing the pre-load checkout or while loading or executing the DMR program, reference is made to the manual test or malfunction isolation procedure that specifies the proper corrective action. This may be either the load failure isolation procedures in Section 3, the manual tests in Section 4, or the SORT-IT listings in Section 5.

1-4. PROGRAM DESCRIPTION. - The 9400 Diagnostic Maintenance Routines (DMR) are a set of seven special-purpose test programs written to detect and isolate logic malfunctions in the 9400 Central Processor (Type 3019), the Input/Output channels, and the Limits Register and Communication Adapter hardware options.

The individual programs that comprise the 9400 DMR program set are as follows:

- 1) DMR Prelude (DMRTOP, tape prelude; DMRDOP, disc prelude)
- 2) Main DMR Program (DMR)
- 3) Limits Register Test (LIMOPT)
- 4) Communications Adapter Test (COM)
- 5) Selector Channel Tests (SELONE, channel 1; SELTWO, channel 2)
- 6) ID Block (IDBLOK)

A complement of manual tests is also provided to isolate malfunctions which, because of their nature or the hardware configuration, cannot be isolated under program control. If an error is detected under program control, the program stops, allowing visual observations to be made at the processor operator and maintenance panels. Panel indications are matched against appropriately formatted listings of malfunction indications in Section 5 (SORT-IT list) to determine the proper card replacement action.

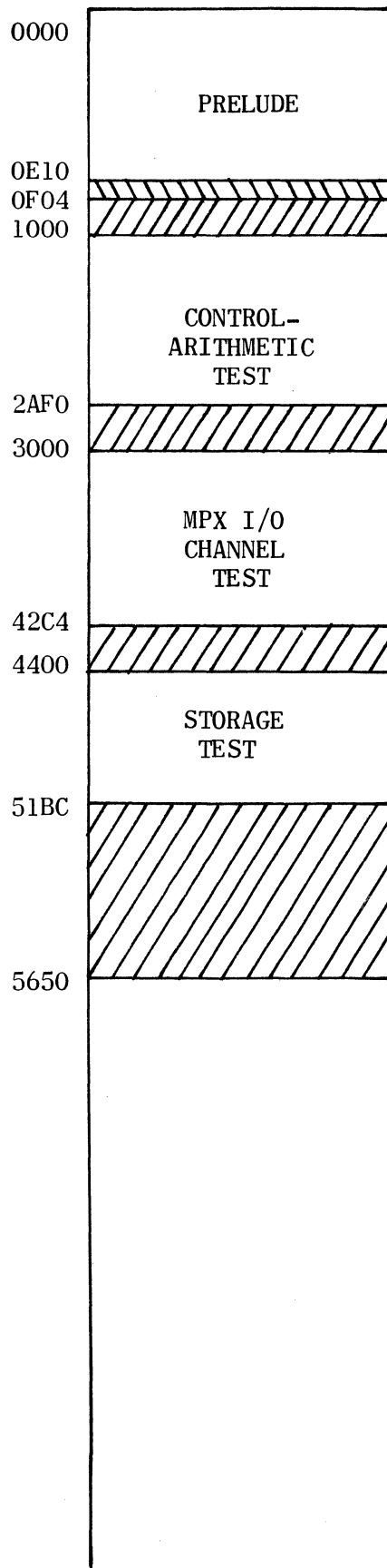
a. Philosophy of Diagnostic Testing. - The general philosophy of testing is that of sequentially executing each instruction in the repertoire beginning with the instructions that require the least amount of logic circuitry for proper execution and proceeding until all logic is tested. This is the "building block" approach where previously verified circuitry is used to subsequently test more complex functions.

Initial testing is performed by the DMR Prelude (at program address 00404) starting with RR and RX type instructions. The DMR Prelude also checks the DØ Adder circuitry and the memory locations which will contain the Main DMR and hardware option tests during their execution. After successful execution of the DMR Prelude, the Main DMR (which includes the Control-Arithmetic Test, Multiplexer Channel I/O Test, and Storage Test) is loaded into memory in five consecutive load operations at contiguous storage locations beginning at address 1000. (See figure 1-1, page 1-4, for 9400 DMR storage allocations.)

At this time, control is passed to the Control-Arithmetic Test which then verifies the logic functions of the remaining 43 central processor instructions not tested by the DMR Prelude. If improper results are detected during the execution of any instruction, or unexpected interrupts are received, a programmed stop occurs and isolation procedures are prescribed.

Following verification of each instruction's function, control is passed to the Multiplexer Channel I/O Test which uses the console in both the shared and non-shared mode to verify Multiplexer Channel logic functions. During this test the operator is instructed to respond to messages printed at the console. Upon his correct response the test resumes execution of channel functions, checking for expected results and halting upon faulty execution. Control is then passed to the next segment of the Main DMR which is the Storage Test.

Initial instructions in the Storage Test determine the processor's storage capacity and print the appropriate size at the console. The Storage Test program is then moved to a lower location in memory after which diagnostic analysis of the storage section is performed.



- 1) SIO instruction located at address 0F04.
- 2) Storage Test moves itself at execution to addresses 1400-21BC.
- 3) Each option DMR is loaded and executed beginning at address 5000.

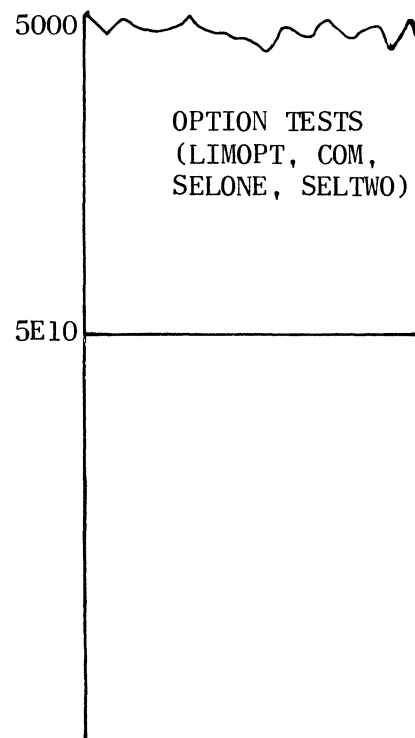


Figure 1-1. 9400 DMR Storage Allocation

The Storage Test is the last segment of the DMR to be executed if there are no hardware options such as a Selector Channel or Communications Adapter installed. If there are no options, control is returned to loaders in the DMR Prelude which immediately load the MAR Prelude. If any of the four hardware options are installed the corresponding DMR's are loaded and executed sequentially beginning with the Limits Register Test (LIMOPT) and followed by the Communications Adapter Test (COM), the Selector Channel 1 Test (SELONE), and the Selector Channel 2 Test (SELTWO). Following the normal execution of the last option, control is again returned to the loaders in the DMR Prelude which load the MAR Prelude.

The method used by the loaders to determine when the MAR Prelude is to be loaded is by use of an end-sentinel. The first word of the end-sentinel block (IDBLOK) is the label 'DMR1'. If the loader detects this label the MAR Prelude is loaded immediately.

b. Description of Tests. The following paragraphs describe each test in the 9400 DMR program set. (Refer to figure 1-2, page 1-6.)

(1) DMR Prelude. - The DMR tape prelude (DMRTOP), which contains the PSW, CCW and BCW's for initially loading the program, is the first block loaded and is bootstrapped into the appropriate low-order storage locations of memory (through address 00F04) where it is resident during execution of the entire program. The first executable instruction in the DMR Prelude is a Halt and Proceed instruction at address 00400. Since this instruction must necessarily be functioning correctly for later execution, it is the first instruction checked. If the instruction fails to function properly, a series of comparisons and conditional branch instructions are used to isolate the failure.

The instructions verified in the remainder of the DMR Prelude are the Start I/O instruction and the 17 RR + RX type instructions. The DMR Prelude also performs a zeros and ones check of the portions of memory to be used by the entire DMR and performs a detailed analysis of circuitry associated with the DØ Adder.

If the DMR Prelude tests are executed successfully, program control is transferred to the loaders in low-order memory between addresses 0200 and 03A6 which in turn load in the next five blocks containing the main DMR program.

Initial load operations from the 8411 Disc File Subsystem utilize the DMR disc prelude (DMRDOP) rather than the DMR tape prelude. The basic difference between the two preludes is within the loader areas where cylinder and track calibrations are required for disc addressing.

(2) Main DMR program. - The main DMR is composed of three segments: the Control-Arithmetic Test, the Multiplexer Channel I/O Test, and the Storage Test. The program is contained on the five blocks of the program tape immediately following the DMR Prelude and on the maintenance disc pack on cylinder 1, tracks 1 through 5.

The first segment of the program, which is the Control-Arithmetic Test, begins execution at address 1000. The test verifies all remaining logic in the central processor not associated with the I/O channels, including the remaining 43 processor instructions and all possible interrupts.

The second segment is the Multiplexer Channel I/O Test which uses the console in both shared and non-shared mode to verify proper operation of the channel. The

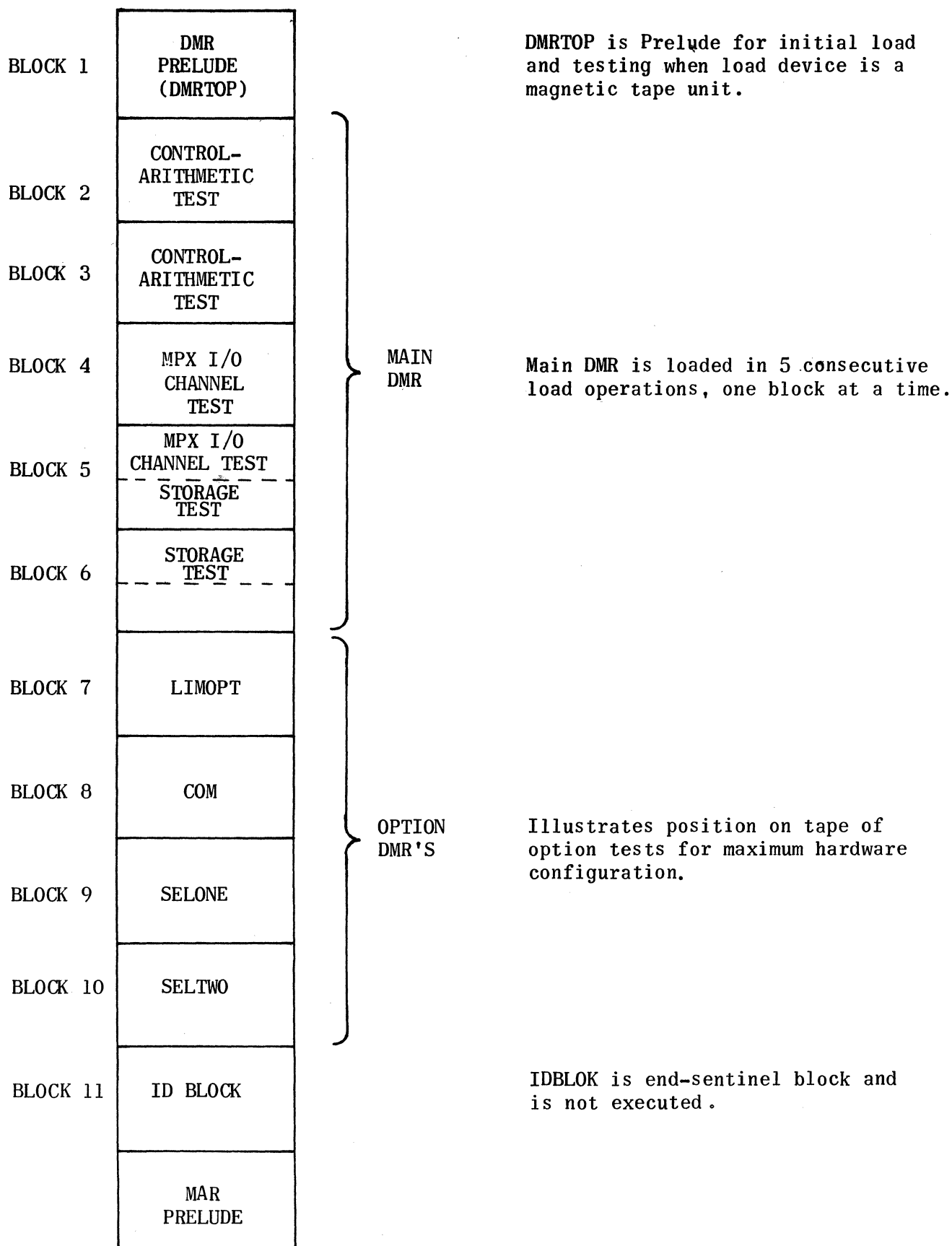


Figure 1-2. Tape Block Formation

first check performed is that of the immediate commands, including a No-op, Select Shared Address, Test I/O, and Illegal Command. If these commands function properly, operation of the Sense and Hold commands is checked next. If a command is not recognized or functions improperly a halt instruction is executed and isolation instructions are referenced. Next, a check is made of the data paths using a routine involving the turn-around of data in a hold/sense loop. If the data paths are functioning correctly, the SCW Flags, Write, Read and Busy Status are checked. Again, if the function does not check out properly a halt instruction is performed and isolation procedures are referenced. Next a check is made of keyboard-to-console data paths.

Immediately following the data path check, the console is selected as a non-shared device in generally the same manner as in the shared test. A No-op command is attempted, then an illegal command, Test I/O, Sense, and Hold. The data paths are tested using a sense/hold turn-around loop. Then the T Flag, Attention Flag, Busy, Delete and EOM functions are checked. Following this check the flags in the SCW are checked, starting with the P and F flags, then the E flag, and finally the D flag. In the non-shared SCW the function code field is used so the following functions are checked next: chain, link, and terminate, in that order. The final routine in the test checks the console logic and transfers control to the Storage Test at address 4400.

(3) Storage Test. - The Storage Test is designed to test the Type 7010 Storage utilized by the 9400 system. The following storage capacities can be tested: 24K, 32K, 48K, 65K, 98K and 131K. The program determines the memory capacity used in the 9400 system and then provides the operator with a print-out on the console printer indicating the memory capacity being tested.

The program consists of a Sumcheck Test, a Bit Dimension Test, a Y Dimension Test, and an X Dimension Test. The following paragraphs describe each test.

(a) Sumcheck test. - The Sumcheck Test determines whether the program was loaded correctly. The test also provides a failure indication if any defects are noted in the area of memory reserved for the Storage Test program.

(b) Bit dimension test. - This test simultaneously tests both bytes. To pre-condition the memory, a "ones" pattern is written into a given address. A "zeros" pattern is then written into the same address after which the address is read and tested. If a failure occurs, the same procedure is repeated using a different address with different Y switch, X driver, and X sink circuits. This is done to determine if the failure is attributable to the bit dimension or to other parts of the memory. If no failure occurs at the new address, a jump is performed to a new test routine. If a failure occurs, however, the processor halts and provides the operator with a bit dimension malfunction indication.

The entire procedure is then repeated using a "ones" pattern.

(c) Y dimension test. - This test consists of two main routines. One routine tests for non-select failures which result in no bit current; the second routine tests for select failures which result in more than one wire in memory being selected simultaneously, thereby causing half-bit current on a given wire. In both routines, both "ones" and "zeros" are tested.

The non-select routine consists of writing a "zeros" and a "ones" pattern on all 16 wires of each bit and then testing for the proper conditions.

The select routine consists of a pre-condition write in which a "ones" and "zeros" pattern is written into each wire 100 times. The complement is then written into one wire 100 times after which the outputs of the remaining wires are tested to determine if half-bit current exists. All wires are tested in this way using both "ones" and "zeros".

Failure number counts, the ANDing of failure addresses, the exclusive ORing of failure addresses, and the exclusive ORing of failure data are used to determine the exact card causing the failure.

(d) X dimension test. - This routine tests for non-select failures in which no word current is present, and for select failures in which the word current is divided between two word straps, thereby causing one-half word current on a given word strap.

The routine consists of writing a "ones" or "zeros" pattern on a selected word strap 100 times, then writing the complement, and subsequently reading and testing this pattern. Each word strap is tested in this way using both "ones" and "zeros".

A failure count, the ANDing of failure addresses, and the exclusive ORing of failure addresses are used to determine the card causing the failure.

(4) Hardware option tests. - The hardware option tests described in the following paragraphs are independent diagnostic tests. Any one or all four tests may be on the site maintenance tape depending on the site hardware configuration. They are dependent only on the loaders in the DMR Prelude for proper loading into memory. The first test is loaded at hexadecimal address 5000. Each succeeding option test, if more than one hardware option is installed, overlays the previous test by again being loaded at 5000.

The first operation performed by each option test is to print out, at the console, the abbreviation of the test currently being executed. Thus, if the Limits Register Test is being executed, the console printout is L.R. If a site configuration has both selector channels, Selector Channel 2 Test (SELTWO) is the last test executed.

(a) Limits register test (LIMOPT). - The Limits Register Test verifies proper operation of the 9400 storage protection feature (F1091-00). The test includes a check of the limits register and all possible interrupts generated on each instruction associated with storage protection. The first procedure installs a set of limits and then attempts a legal store (one within the set limits). If this store procedure functions properly, the next procedure attempts an illegal store into memory both above and below the set limits. Next a privileged instruction is checked for proper operation. The write protect interrupts are then tested followed by a check of all bits involved in limits register operation. If all checks produce the correct results, a final check is made to verify proper interrupt and non-interrupt generation for all instructions capable of causing a limits exception. Control is then transferred to the loader in the DMR Prelude which in turn automatically loads the next option test.

(b) Communication adapter test (COM). - The Communication Adapter Test verifies the control byte compare feature of the non-shared multiplexer subchannels. The test is performed using the console in a non-shared mode and making a series of control byte comparisons using all possible bit combinations. As in previous tests, a halt is executed and isolation procedures are referenced if improper results occur. Upon completion of this test, control is passed to the loader which automatically loads and executes the next option test.

(c) Selector channel 1 test (SELONE). - The Selector Channel 1 test uses the channel tester to verify proper operation of the data paths and control logic associated with Selector Channel 1. As in all option tests, the first operation performed is to identify, by means of a console printout, the test being executed. In this case the printout SEL1 will appear at the console.

The test first allows for a Selector 1 interrupt without issuing a Start I/O instruction or having the tester enabled and then checks to see that the CSW can be cleared. The test then checks for proper condition code setting by issuing a Start I/O and no device number and then testing for a condition code of 3, which indicates a non-operative condition. Using the Start I/O and device number of 00 an interrupt should not occur; if it does, a fault is indicated and a halt instruction executed. Next, a Start I/O is issued with the tester enabled. A test is then performed to determine if the interrupt, condition code and CSW are proper and if the input to the channel equals the output. Next, an output function is attempted with a Write code, followed by a check for the proper results including operation of the write function, condition code, and input/output equality. A Command Chain with Write function is then attempted followed by a check of the condition code and the first and second instruction word data. Next, a Command Chain on a Read is attempted. The function is then tested to ensure the CSW for the read function is properly set up. Next a Sense and Read Backward Command is attempted and tested for successful execution. If the test is executed successfully, control is transferred to the loader and either the next option test or the MAR Prelude is loaded.

(d) Selector channel 2 test (SELTWO). - The SELTWO test is identical to SELONE except it is performed on Selector Channel 2 instead of 1.

(e) ID block (IDBLOK). - In the execution of the 9400 DMR the ID Block code is not executed; it is used as an end-sentinel for the termination of the tests and initiation of the MAR Prelude. The first word in the ID Block routine is the EBCDIC code for the symbol "DMR1". The loaders in the DMR Prelude test for this identification upon loading each block. If the identification is found, the MAR Prelude is immediately loaded.

1-5. REQUIRED TOOLS AND TEST EQUIPMENT. - The following items are required to perform the testing and malfunction isolation procedures described in this manual.

- 1) 20,000 ohm/volt multimeter (Simpson Model 260 or equivalent)
- 2) Card extractor, Univac part no. 3162891-00

1-6. APPLICABLE DOCUMENTS. - The following documents should be available for reference when using the 9400 DMR manual.

SD 10114-00	Service Diagram Manual
PDD 4091618	9400 Test Sequence Generator
PDD 4091602	9400 MAR Prelude Test

1-7. GLOSSARY OF SPECIAL TERMS. - The following is a list of special terms used in the diagnostic procedures and their meanings.

Card	Printed circuit card (plug-in module)
COM	Abbreviation for Communications Adapter Test

Cycle	Condition wherein processor repeatedly executes same group of instructions in same sequence while appearing to be in a running condition (RUN indicator lit).
DMR	Diagnostic Maintenance Routines
DMRDOP	Abbreviation for DMR disc prelude
DMRTOP	Abbreviation for DMR tape prelude
Error Stop	A programmed stop resulting from an unexpected condition during execution of a "halt and proceed" instruction. (STOP indicator is lit and B1 display, R2 (FØ), equals 99.)
H	Abbreviation used to denote a logical high or +6 volt (nominal) dc level.
Hexadecimal	Number system in which the base of operation is 16. (Refer to Table 2-2, page 2-2, for a listing of hexadecimal-to-binary conversions.)
IDBLOK	Abbreviation for identification block routine
L	Abbreviation used to denote a logical low or zero volt (nominal) dc level.
LIMOPT	Abbreviation for Limits Register Test
Logical OR	A procedure used in the memory manual tests by which several binary values are operated on to produce a single binary resultant value. (For procedure, refer to paragraph 2-5c, page 2-10.)
Loop	Condition wherein processor repeatedly executes same instruction while appearing to be in a running condition (RUN indicator lit).
MAR	Maintenance Acceptance Routines
No Find	Condition wherein either program runs to successful completion with suspected malfunction in processor, or procedures fail to correctly isolate malfunction detected by program. (Refer to paragraph 2-5a, page 2-8, for additional information.)
Observe	Visually inspect (recording, if necessary) condition of specified displays and/or indicators on maintenance and operator panels to analyze and/or isolate equipment malfunctions.
Pin	Refers to actual pin on printed circuit card.
Probe	Monitor a specified pin on backpanel with lead connected to MAINTENANCE PROBE indicator on processor maintenance panel.

Replace	Physically remove specified printed circuit card from chassis using card extractor and install known good card (with identical type number) in its place. (Refer to paragraph 2-5 <u>b</u> , page 2-8, for procedure.)
SELONE	Abbreviation for Selector Channel 1 Test
SELTWO	Abbreviation for Selector Channel 2 Test
Set	When referring to toggle switches, physically place switch in specified position. When referring to maintenance panel, press indicator-switch corresponding to specified bit. When referring to register values, press indicator-switches corresponding to specified hexadecimal value.
SORT-IT	General purpose program used to edit, sort, and list synthesized malfunction data in predetermined formats. (Refer to paragraph 5-1, page 5-1, for additional information.)
Test	Measure the dc level at a specified test point or pin on backpanel with a multimeter.
Test Point	Refers to actual test point on printed circuit card.
Load Failure	Any malfunction that inhibits the normal program loading operation. (Refer to Step 6 of paragraph 2-3 <u>a</u> , page 2-2, for conditions denoting proper load.)

SECTION 2

OPERATING INSTRUCTIONS

2-1. GENERAL. - This section of the manual contains detailed step-by-step instructions for loading and executing the 9400 DMR program. It also contains a procedure for manually checking the static condition of the processor prior to loading the DMR program.

2-2. PRELOAD CHECKOUT PROCEDURE. - The following procedure must be performed prior to loading or attempting to load the 9400 DMR program.

- Step 1. If power is not applied to processor, apply power by setting processor POWER switch to up position and then performing Step 2. If power is already applied, press SWITCH ENABLE switch to active position, press SYSTEM RESET switch, and then perform Step 2.
- Step 2. Observe that only PROCESSOR TEST MODE and STOP indicators are lit on Operator Panel.
 - a) If proper condition exists, perform Step 3.
 - b) If one or more PROCESSOR POWER indicators are lit, remove power from processor and notify site maintenance personnel.
 - c) If one or more TEMP CHECK or AIR CHECK indicators are lit, remove power from processor and notify site maintenance personnel.
 - d) If any LOAD or LOGIC STOP indicators are lit, perform System Reset Investigation in paragraph 3-2a, page 3-1.
 - e) If either PROCESSOR TEST MODE or STOP indicator is extinguished, perform System Reset Investigation in paragraph 3-2a, page 3-1.
- Step 3. Observe CLOCK PHASE indicators.
 - a) If all indicators are extinguished, perform Step 4.
 - b) If one or more indicators are lit, perform Phase Enable Manual Test in paragraph 4-2g, page 4-48.
- Step 4. Observe CLOCK RATE indicators. Only NORMAL should be lit.
 - a) If only NORMAL is lit, perform Step 5.
 - b) If any other condition exists, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 5. Observe CYCLE COUNT indicator.
 - a) If extinguished, perform Step 6.
 - b) If lit, perform System Reset Investigation in paragraph 3-2a, page 3-1.
- Step 6. Press LAMP TEST switch to active position and hold in that position while observing maintenance panel indicators.
 - a) If all indicators light, perform Step 7.
 - b) If any indicator fails to light, remove power from processor and replace corresponding indicator. (If necessary, replace indicator-switch module.)
- Step 7. Press STOP switch and hold in active position while observing operator panel indicators.
 - a) If all indicators light, perform Step 8.
 - b) If any indicator fails to light, remove power from processor and replace corresponding indicator.
- Step 8. Ensure SWITCH ENABLE switch is in active position and all other switches are in inactive position.

Step 9. Position rotary switches A, B, C, and D at 1.

Step 10. Refer to paragraph 2-3 for appropriate program loading instructions.

2-3. PROGRAM LOADING INSTRUCTIONS. - The program loading instructions are divided into two parts: Multiplexer Channel loading instructions, and Selector Channel loading instructions. If a Multiplexer Channel loading device is available, refer directly to the program loading instructions in paragraph 2-3a and do as directed. If only a Selector Channel loading device is available, refer to the program loading instructions in paragraph 2-3b, page 2-3.

a. Multiplexer Channel Loading Instructions. - The following is the step-by-step procedure for loading the 9400 DMR program via the Multiplexer Channel loading device (UNISERVO VI-C Subsystem).

Step 1. Mount 9400 DMR program tape on Multiplexer Channel loading device.

NOTE

If Multiplexer Channel loading device is not available, load program via Selector Channel. (Refer to paragraph 2-3b, page 2-3, for procedure.)

Step 2. At loading device, advance program tape to load point.

Step 3. Select proper load address by setting appropriate LOAD ADDRESS CHANNEL NUMBER, CONTROL UNIT NUMBER, and DEVICE NUMBER switches to active position.

NOTE

Device addresses vary with individual sites.

Step 4. Press SYSTEM RESET switch.

Step 5. Press LOAD switch to initiate program load.

Step 6. Observe conditions specified in a) through i) below. If all conditions exist, refer to Step 7; if one or more conditions do not exist, refer to Step 8.

- a) Tape should not be moving on load device. If tape is moving, press LOCAL switch on loading device and refer to Step 8.
- b) STOP indicator should be lit.
- c) PROCESSOR TEST MODE indicator should be lit.
- d) All LOGIC STOP indicators should be extinguished.
- e) All LOAD indicators should be extinguished.
- f) At D1 display, PSW INSTRUCTION ADDRESS (PØ) should equal 00404.
- g) At D2 display, AØ REGISTER should equal 00A0A.
- h) At B1 display, OPERATION CODE (FØ) should equal 99, R1 (FØ) should equal 0, and R2 (FØ) should equal 0.
- i) At C1 display, COND CODE (PØ) indicators 34 and 35 should be lit.

Step 7. Referral to this step indicates the DMR Prelude program was successfully loaded. Execute program according to instructions in paragraph 2-4, page 2-4.

Step 8. Referral to this step indicates the DMR Prelude program failed to load properly. Select one of the two available options listed below and do as directed.

NOTE

If this is the second attempt at loading via the Multiplexer Channel, ignore options and perform Step 9.

- a) If an alternate channel is available, attempt to reload program via Selector Channel loading device. (Refer to paragraph 2-3b for procedure.)
- b) If an alternate channel is not available, refer to Step 9 for malfunction isolation instructions.

- Step 9. At D1 display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.
- a) If register equals any value from 00400 through 00470, refer to PRL formatted list in paragraph 5-5 (PRL tab).
 - b) If register equals any other value, refer to MXL formatted list in paragraph 5-4 (MXL tab). If error display is not listed in MXL formatted list, perform System Reset Investigation in paragraph 3-2a, page 3-1.

b. Selector Channel Loading Instructions. - The following is the step-by-step procedure for loading the 9400 DMR program via the Selector Channel loading device (UNISERVO 12/16C Magnetic Tape Subsystem or Univac 8411 Disc File Subsystem).

NOTE

Only Selector Channel 1 may be used for loading.

- Step 1. Mount 9400 DMR program tape on Selector Channel tape unit, or mount DMR disc on disc unit.
- Step 2. Advance program tape to load point, or prepare disc unit by following instructions in Maintenance Handbook MH2294, whichever is appropriate.
- Step 3. Select proper load address by setting appropriate LOAD ADDRESS CHANNEL NUMBER, CONTROL UNIT NUMBER, and DEVICE NUMBER switches to active position.

NOTE

Device addresses vary with individual sites.

- Step 4. Press SYSTEM RESET switch.
- Step 5. Press LOAD switch to initiate program load.
- Step 6. Observe conditions specified in a) through i) below. If all conditions exist, refer to Step 7; if one or more conditions do not exist, refer to Step 8.
- a) Tape should not be moving on load device. If tape is moving, press LOCAL switch on loading device and refer to Step 8.
 - b) STOP indicator should be lit.
 - c) PROCESSOR TEST MODE indicator should be lit.
 - d) All LOGIC STOP indicators should be extinguished.
 - e) All LOAD indicators should be extinguished.
 - f) At D1 display, PSW INSTRUCTION ADDRESS (PØ) should equal 00404.
 - g) At D2 display, AØ REGISTER should equal 00A0A.
 - h) At B1 display, OPERATION CODE (FØ) should equal 99, R1 (FØ) should equal 0, and R2 (FØ) should equal 0.
 - i) At C1 display, COND CODE (PØ) indicators 34 and 35 should be lit.
- Step 7. Referral to this step indicates the DMR Prelude program was successfully loaded. Execute program according to instructions in paragraph 2-4, page 2-4.

Step 8. Referral to this step indicates the DMR Prelude program failed to load properly. Select one of the two available options listed below and do as directed.

- a) If a Multiplexer Channel is not available, refer to Step 9 for malfunction isolation instructions.
- b) If this load attempt was preceded by an unsuccessful load on the Multiplexer Channel, attempt one more load on the Multiplexer Channel using the procedure in paragraph 2-3a, page 2-2.

Step 9. At D1 display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.

- a) If register equals any value from 00400 through 00470, refer to PRL formatted list in paragraph 5-5 (PRL tab).
- b) If register equals any other value, refer to Selector Channel Load Failure Analysis in paragraph 3-3, page 3-57.

2-4. PROGRAM EXECUTION INSTRUCTIONS. - The following is the step-by-step procedure for executing the 9400 DMR program. It is assumed that the preload checkout procedure in paragraph 2-2, page 2-1, was performed, and the DMR Prelude program was successfully loaded according to the loading instructions in paragraph 2-3, page 2-2. It is also assumed that this procedure was referenced directly from the program loading instructions and that all switches, indicators, and displays are in the states specified in the loading instructions.

Step 1. Ensure console print wheel is positioned at left margin.

Step 2. Press C display CLEAR switch.

Step 3. Press RUN switch.

NOTE

This action causes execution of DMR Prelude and subsequent loading and execution of CPU-DMR. The total time required for these operations is approximately two seconds.

Step 4. After initiating program, observe console for the following printout:

DMR MPX-SHARED I/O TEST

ABCDEFGHIJKLMNQRSTUWXYZ 0123456789

PRESS ATTENTION KEY IF PRINT ABOVE IS OK

- a) If correct printout occurred, perform Step 5.
- b) If wrong printout occurred, determine print code (PC) from 1) and 2) below and then refer to MXR formatted list in paragraph 5-7 (MXR tab).
 - 1) If printout stopped after DMR MPX-SHARED I/O TEST, use a print code (PC) of 1.
 - 2) If printout stopped after ABCDEFGHIJKLMNQRSTUWXYZ 0123456789, use a print code (PC) of 2.
- c) If no printout occurred, at D1 display observe PSW INSTRUCTION ADDRESS (PØ) indicators.
 - 1) If register equals any value from 00000 to 001E8, refer to SlR formatted list in paragraph 5-8 (SlR tab) if program was loaded via Selector Channel 1; or to MXR formatted list in paragraph 5-7 (MXR tab) if program was loaded via Multiplexer Channel.

NOTE

If referencing MXR formatted list, use print code (PC) of 0.

- 2) If register equals 001E8 through 00F00, refer to PRL formatted list in paragraph 5-5 (PRL tab).
- 3) If register equals 00F04 through 00F08, refer to MXL formatted list in paragraph 5-4 (MXL tab) if program was loaded via Multiplexer Channel; or to SIL formatted list in paragraph 5-2 (SIL tab) if program was loaded via Selector Channel 1.
- 4) If register equals any value from 01000 through 02FFF, refer to DMR formatted list in paragraph 5-6 (DMR tab).
- 5) If register equals any value from 03000 through 04300, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a blank print code (PC).
- 6) If register equals a value greater than 06000, refer to PRL formatted list in paragraph 5-5 (PRL tab).
- 7) If register is cycling, refer to PRL formatted list in paragraph 5-5 (PRL tab).

Step 5. At console, press ATTENTION key.

Step 6. Observe console for the following printout:

PRESS DELETE KEY

- a) If correct printout occurred, perform Step 7.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of 3.

Step 7. At console, press DELETE key.

Step 8. Observe console for the following printout:

PRESS END OF MESSAGE KEY

- a) If correct printout occurred, perform Step 9.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of 4.

Step 9. At console, press EOM (end of message) key.

Step 10. Observe console for the following printout:

TYPE CHARACTERS BETWEEN PARENS: (OI)

- a) If correct printout occurred, perform Step 11.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of 5.

Step 11. At console, press zero key, followed by upper case "N" key and space.

Step 12. Observe console for the following printout:

TYPE CHARACTERS BETWEEN PARENS: (Eφ)

- a) If correct printout occurred, perform Step 13.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of 6.

Step 13. At console, press "E" key followed by upper case "M" key and space.

Step 14. Observe console for the following printout:

TYPE IN 2 CARRIAGE RETURNS

- a) If correct printout occurred, perform Step 15.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of 7.

Step 15. At console, press RETURN (carriage return) key twice.

Step 16. Observe console for the following printout:

TYPE IN TWO SPACES

- a) If correct printout occurred, perform Step 17.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of 8.

Step 17. At console, press space bar twice.

Step 18. Observe console for the following printout:

END OF MPX-SHARED TEST:

BEGIN NON-SHARED TEST.

PRESS ATTENTION KEY

- a) If correct printout occurred, perform Step 19.
- b) If no printout or an incorrect printout occurred, determine print code (PC) from 1) through 3) below and then refer to MXR formatted list in paragraph 5-7 (MXR tab).
 - 1) If printout stopped after TYPE IN TWO SPACES, use a print code of 9.
 - 2) If printout stopped after END OF MPX-SHARED TEST, use a print code of A.
 - 3) If printout stopped after BEGIN NON-SHARED TEST, use a print code of B.

Step 19. At console, press ATTENTION key.

Step 20. Observe console for the following printout:

PRESS DELETE KEY

- a) If correct printout occurred, perform Step 21.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of C.

Step 21. At console, press DELETE key.

Step 22. Observe console for the following printout:

PRESS END-OF MESSAGE KEY

- a) If correct printout occurred, perform Step 23.
- b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of D.

Step 23. At console, press EOM (end of message) key.

NOTE

This action initiates execution of Storage Test portion of DMR program.

- Step 24. At console, observe that END OF MPX is printed on same line as PRESS END-OF MESSAGE KEY printout.
- a) If correct printout occurred, perform Step 25.
 - b) If no printout or an incorrect printout occurred, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of E.
 - c) If printout stopped after END OF MPX, observe value of PSW INSTRUCTION ADDRESS (PØ) at D1 display.
 - 1) If register equals 01468, refer to Storage Test Error Stop Listing (Table 2-1, page 2-9).
 - 2) If register equals any other value, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of F.

Step 25. Observe console for the following printout:

```
131K MEMORY
ENABLE THE TIMER NOW (FOR SEL1)
L.R.
C.A.
SEL1
SEL2
END DMR
```

NOTE

The above printout is for a maximum configuration of hardware including a 131K memory, limits register, communications adapter and two selector channels. Optional test programs will be executed only if the hardware options are actually installed in processor. Printout identifying memory size will vary according to size of memory installed in processor.

- a) If correct printout occurred and D1 display on processor maintenance panel equals 008BE, 9400 DMR program was successfully executed and MAR Prelude program was loaded. For MAR execution instructions, refer to drawing number 4091602.
- b) If incorrect printout occurred, observe last line printed out, then perform appropriate action specified below.
 - 1) If memory size was last line printed, refer to Storage Test Error Stop Listing (Table 2-1, page 2-9).
 - 2) If ENABLE TIMER NOW (FOR SEL1) was last line printed, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of G.
 - 3) If L.R. was last line printed, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of H.

- 4) If C.A. was last line printed, refer to MXR formatted list in paragraph 5-7 (MXR tab) and use a print code (PC) of I.
- 5) If SEL1 was last line printed, refer to S1R formatted list in paragraph 5-8 (S1R tab).
- 6) If SEL2 was last line printed, refer to S2R formatted list in paragraph 5-9 (S2R tab).

2-5. SPECIAL PURPOSE PROCEDURES. - The following paragraphs contain detailed procedures for performing operations such as restarting the program after a stop-page, replacing cards, and recovering from no find conditions.

a. Procedure For Recovering From No Finds. - A no find condition exists if the malfunction isolation procedures fail to correctly isolate a malfunction detected by the diagnostic program. The following are suggestions for recovering from a no find condition.

- 1) If the malfunction isolation procedures fail to correctly isolate the malfunction, rerun the test, recording all abnormal conditions and displays. Perform all referenced procedures in the order specified, following all instructions explicitly. When scoping test points, use logic diagrams in conjunction with diagnostic procedures.
- 2) Compile and analyze data relating to logic area affected by malfunction and type of malfunction.
- 3) Utilize test descriptions in Section 1 and program listing in Section 6 to assist in analyzing malfunction.
- 4) Use conventional troubleshooting techniques to isolate and correct malfunction (functional schematics, oscilloscope, maintenance probe or multimeter, and theory of operation section of 9400 instruction manual).

b. Card Replacement Procedure. - To replace a printed circuit card, perform the following steps.

- Step 1. Remove power from processor by setting POWER switch to OFF.
- Step 2. Locate specified card on chassis.
- Step 3. Using recommended card extractor, remove card from chassis.
- Step 4. Insert replacement card in chassis by gently setting the card pins in the connector and then slowly and firmly pushing the card in until a solid connection is made.

NOTE

Replacement card must be same or later revision level.

- Step 5. Apply power to processor by setting POWER switch to ON.
- Step 6. Verify proper operation of processor by performing the following program restarting procedure.
 - a) Press SYSTEM RESET switch.
 - b) Rewind program tape to load point.
 - c) Refer to Preload Checkout Procedure in paragraph 2-2, page 2-1, and perform specified operations.

NOTE

If a successful load (as defined in Step 6 of paragraph 2-3a, page 2-2) was accomplished on the initial load attempt, refer directly to the appropriate program loading procedure in paragraph 2-3, page 2-2, and perform specified operations.

Table 2-1. Storage Test Error Stop Listing

<u>PØ</u> <u>VALUE</u>	<u>REFER TO</u> <u>PARAGRAPH</u>	<u>ON PAGE</u>	<u>REMARKS</u>
01468	4-3a(1)	4-49	Sumcheck Test
01A70	4-3a(2)	4-49	Bit Dimension 0's Test, Unit 2, Stack 2
01A7C	4-3a(4)	4-50	Bit Dimension 0's Test, Unit 1, Stack 2
01A80	4-3a(3)	4-49	Bit Dimension 0's Test, Unit 2, Stack 1
01A8A	4-3a(5)	4-51	Bit Dimension 1's Test, Unit 2, Stack 2
01AC6	4-3a(7)	4-51	Bit Dimension 1's Test, Unit 1, Stack 2
01ACA	4-3a(6)	4-51	Bit Dimension 1's Test, Unit 2, Stack 1
01B5C	4-3a(13)	4-54	Y Dimension N-SEL 0's Test, Unit 2, Stack 2, Byte 1
01B60	4-3a(12)	4-54	Y Dimension N-SEL 0's Test, Unit 2, Stack 2, Byte 0
01B6C	4-3a(11)	4-53	Y Dimension N-SEL 0's Test, Unit 1, Stack 2, Byte 1
01B70	4-3a(9)	4-52	Y Dimension N-SEL 0's Test, Unit 1, Stack 2, Byte 0
01B7C	4-3a(10)	4-53	Y Dimension N-SEL 0's Test, Unit 2, Stack 1, Byte 1
01B80	4-3a(8)	4-52	Y Dimension N-SEL 0's Test, Unit 2, Stack 1, Byte 0
01BDC	4-3a(19)	4-57	Y Dimension N-SEL 1's Test, Unit 2, Stack 2, Byte 1
01BE0	4-3a(15)	4-55	Y Dimension N-SEL 1's Test, Unit 2, Stack 2, Byte 0
01BEC	4-3a(17)	4-56	Y Dimension N-SEL 1's Test, Unit 1, Stack 2, Byte 1
01BF0	4-3a(18)	4-56	Y Dimension N-SEL 1's Test, Unit 1, Stack 2, Byte 0
01BFC	4-3a(16)	4-55	Y Dimension N-SEL 1's Test, Unit 2, Stack 1, Byte 1
01C00	4-3a(14)	4-55	Y Dimension N-SEL 1's Test, Unit 2, Stack 1, Byte 0
01CB2	4-3a(25)	4-59	Y Dimension SEL 0's Test, Unit 2, Stack 2, Byte 1
01CB6	4-3a(24)	4-59	Y Dimension SEL 0's Test, Unit 2, Stack 2, Byte 0
01CC2	4-3a(23)	4-58	Y Dimension SEL 0's Test, Unit 1, Stack 2, Byte 1
01CC6	4-3a(21)	4-58	Y Dimension SEL 0's Test, Unit 1, Stack 2, Byte 0
01CD2	4-3a(22)	4-58	Y Dimension SEL 0's Test, Unit 2, Stack 1, Byte 1
01CD6	4-3a(20)	4-57	Y Dimension SEL 0's Test, Unit 2, Stack 1, Byte 0
01CFA	4-3a(31)	4-60	Y Dimension U/L SEL 0's Test, Unit 2, Stack 2, Byte 1
01CFE	4-3a(30)	4-60	Y Dimension U/L SEL 0's Test, Unit 2, Stack 2, Byte 0
01DOA	4-3a(29)	4-60	Y Dimension U/L SEL 0's Test, Unit 1, Stack 2, Byte 1
01DOE	4-3a(27)	4-60	Y Dimension U/L SEL 0's Test, Unit 1, Stack 2, Byte 0
01D1A	4-3a(28)	4-60	Y Dimension U/L SEL 0's Test, Unit 2, Stack 1, Byte 1
01D1E	4-3a(26)	4-60	Y Dimension U/L SEL 0's Test, Unit 2, Stack 1, Byte 0
01DD0	4-3a(37)	4-62	Y Dimension SEL 1's Test, Unit 2, Stack 2, Byte 1
01DD4	4-3a(36)	4-62	Y Dimension SEL 1's Test, Unit 2, Stack 2, Byte 0
01DE0	4-3a(35)	4-61	Y Dimension SEL 1's Test, Unit 1, Stack 2, Byte 1
01DE4	4-3a(33)	4-61	Y Dimension SEL 1's Test, Unit 1, Stack 2, Byte 0
01DF0	4-3a(34)	4-61	Y Dimension SEL 1's Test, Unit 2, Stack 1, Byte 1
01DF4	4-3a(32)	4-60	Y Dimension SEL 1's Test, Unit 2, Stack 1, Byte 0
01E18	4-3a(43)	4-63	Y Dimension U/L SEL 1's Test, Unit 2, Stack 2, Byte 1
01E1C	4-3a(42)	4-63	Y Dimension U/L SEL 1's Test, Unit 2, Stack 2, Byte 0
01E28	4-3a(41)	4-63	Y Dimension U/L SEL 1's Test, Unit 1, Stack 2, Byte 1
01E2C	4-3a(39)	4-63	Y Dimension U/L SEL 1's Test, Unit 1, Stack 2, Byte 0
01E38	4-3a(40)	4-63	Y Dimension U/L SEL 1's Test, Unit 2, Stack 1, Byte 1
01E3C	4-3a(38)	4-63	Y Dimension U/L SEL 1's Test, Unit 2, Stack 1, Byte 0
01EDE	4-3a(44)	4-63	X Dimension Test, Unit 2, Stack 2, Byte 1
01EE2	4-3a(45)	4-67	X Dimension Test, Unit 2, Stack 2, Byte 0
01EF6	4-3a(46)	4-71	X Dimension Test, Unit 1, Stack 2, Byte 1
01EFA	4-3a(47)	4-77	X Dimension Test, Unit 1, Stack 2, Byte 0
01F06	4-3a(48)	4-82	X Dimension Test, Unit 2, Stack 1, Byte 1
01FOA	4-3a(49)	4-86	X Dimension Test, Unit 2, Stack 1, Byte 0
01F16	4-3a(50)	4-90	X Dimension Test, Unit 1, Stack 1, Byte 1
01F1A	4-3a(51)	4-95	X Dimension Test, Unit 1, Stack 1, Byte 0

c. Procedure For Performing Logical OR. - Several times in the storage manual tests the operator is directed to "logically OR" a series of addresses and then locate the resultant value in a card replacement listing. The procedure for performing a logical OR operation is as follows:

- Step 1. Convert each hexadecimal value to be operated on to its binary equivalent. (Refer to conversion table on page 2- .)
- Step 2. Arrange converted values in a column, being careful to keep bit positions vertically aligned.
- Step 3. Compute the resultant value as follows:
 - a) Set each bit position of the resultant value to a "1" whenever the corresponding bit position of one or more converted values is a "1".
 - b) Set each bit position of the resultant value to a "0" whenever the corresponding bit position of all converted values is a "0".
- Step 4. Convert resultant binary value to hexadecimal value to complete logical OR operation. (Refer to conversion table on page 2- .)

Example:

<u>Hexadecimal</u>		<u>Binary Equivalent</u>				
0F1CA	=	0000	1111	0001	1100	1010
04300	=	0000	0100	0011	0000	0000
13A9A	=	0001	0011	1010	1001	1010
Resultant Binary Value	=	0001	1111	1011	1101	1010
Resultant Hexadecimal Value	=	1	F	B	D	A

Table 2-2. Hexadecimal To Binary Conversion Table

<u>HEXADECIMAL VALUE</u>	<u>BINARY VALUE</u>	<u>HEXADECIMAL VALUE</u>	<u>BINARY VALUE</u>
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

d. Procedure For Initiating Maintenance Acceptance Routine (MAR). - The MAR Prelude may be loaded only after successfully loading the DMR Prelude and at no other time during execution of the DMR. After successfully loading the DMR Prelude, as described in paragraph 2-3, the execution of the remaining portions of the 9400 DMR may be bypassed in favor of loading and executing the MAR. To accomplish this, perform the following steps:

- Step 1. Press SYSTEM RESET switch.
- Step 2. Position rotary switch D at 1.
- Step 3. Set PSW INSTRUCTION ADDRESS (PØ) to 00200.
- Step 4. Press RUN switch and observe processor stops with PSW INSTRUCTION ADDRESS (PØ) equal to 008EE.

NOTE

This action loads the MAR Prelude program. For execution of the MAR program, refer to drawing number 4091602.

e. Procedure For Restarting Program After Stop. - The 9400 DMR program may be restarted after a stop provided no changes have been made at either the maintenance panel or operator panel.

- 1) To restart the program from the point of stoppage, press the RUN switch.
- 2) To bypass the current section of the DMR, refer to paragraph 2-5f.
- 3) To restart the program from the beginning, refer to paragraph 2-2, page 2-1.

f. Procedure For Bypassing Segments of Program. - The following procedure is performed when it is desirable to skip the remaining portion of an individual test during execution of the DMR program. The procedure enables the loaders to load and execute the next sequential test in the program.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Position rotary switch D at 1 and set PSW INSTRUCTION ADDRESS (PØ) to 00214.
- Step 3. Press RUN switch.

SECTION 3

LOAD FAILURE ANALYSIS

3-1. GENERAL. - This section of the manual contains the detailed step-by-step procedures for analyzing and isolating malfunctions that inhibit loading the 9400 DMR program. The section is divided into two main parts: Multiplexer Channel load failure analysis in paragraph 3-2 and Selector Channel load failure analysis in paragraph 3-3, page 3- .

The procedures in this section are normally referenced from the program loading instructions in paragraph 2-3 as a result of an unsuccessful load attempt.

3-2. MULTIPLEXER CHANNEL LOAD FAILURE ANALYSIS. - The following procedures are used to isolate and correct malfunctions that inhibit successfully loading the 9400 DMR program from the Multiplexer Channel. The procedures are normally referenced from the program loading instructions as a result of an improper load.

a. System Reset Investigation. - The following procedure is used to verify proper operation of the system reset (master clear) circuitry. In case of improper operation the system reset manual tests in Section 4 are referenced.

- Step 1. Ensure that the following switches are in inactive position: SELECTOR TESTER 1 and 2, DISABLE TIMER, DECREMENT STORAGE ADDRESS, CONSOLE OFF LINE, DISABLE STOP I/O PARITY and STORAGE PARITY, MAINTENANCE READ and WRITE, and ADDRESS COMPARE READ STOP and WRITE STOP.
- Step 2. Press SWITCH ENABLE switch to active position.
- Step 3. Position rotary switches A, B, C and D at 1.
- Step 4. Press SYSTEM RESET switch.
- Step 5. Observe CLOCK RATE NORMAL indicator.
 - a) If lit, perform Step 6.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 6. Observe STOP indicator.
 - a) If lit, perform Step 7.
 - b) If extinguished, perform Operator/Maintenance Panel Manual Test in paragraph 4-2a(1), page 4-1.
- Step 7. Observe that only CLOCK RATE NORMAL, PROCESSOR TEST MODE, and STOP indicators are lit.

NOTE

Ignore MAINTENANCE PROBE which may or may not be lit.

- a) If only correct indicators are lit, perform Step 8.
 - b) If any other indicator is lit perform Operator/Maintenance Panel Manual Test in paragraph 4-2a(1), page 4-1.
- Step 8. Using rotary switch A, perform the operations specified in a) through h) below.
- a) Position rotary switch A at 1 and observe A display.
 - 1) If all indicators are extinguished, refer to b).
 - 2) If one or more indicators are lit, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.

- b) Position rotary switch A at 2 and observe A display. All indicators should be extinguished except CLOCK CYCLE COUNTER (MØ) indicators which should equal FF.
 - 1) If display is correct, refer to c).
 - 2) If CLOCK CYCLE COUNTER (MØ) equals any value other than FF, perform Cycle Counter Manual Test in paragraph 4-2e, page 4-46.
 - 3) If display is otherwise incorrect, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.
- c) Position rotary switch A at 3 and observe A display.
 - 1) If all indicators are extinguished, refer to d).
 - 2) If one or more indicators are lit, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.
- d) Position rotary switch A at 4 and observe A display.
 - 1) If all indicators are extinguished, refer to e).
 - 2) If one or more indicators are lit, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.
- e) Position rotary switch A at 5 and observe A display.
 - 1) If all indicators are extinguished, refer to f).
 - 2) If one or more indicators are lit, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.
- f) Position rotary switch A at 6 and observe A display.
 - 1) If all indicators are extinguished, refer to g).
 - 2) If one or more indicators are lit, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.
- g) Position rotary switch A at 7 and observe A display.
 - 1) If all indicators are extinguished, refer to h).
 - 2) If one or more indicators are lit, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.
- h) Position rotary switch A at 8 and observe A display.
 - 1) If all indicators are extinguished, perform Step 9.
 - 2) If one or more indicators are lit, perform A Display Manual Test in paragraph 4-2a(2), page 4-4.

Step 9. Using rotary switch B, perform the operations specified in a) through h) below.

- a) Position rotary switch B at 1 and observe B display.
 - 1) If all indicators are extinguished, refer to b).
 - 2) If one or more indicators are lit, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.
- b) Position rotary switch B at 2 and observe B display.
 - 1) If all indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.
- c) Position rotary switch B at 3 and observe B display.
 - 1) If all indicators are extinguished, refer to d).
 - 2) If one or more indicators are lit, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.
- d) Position rotary switch B at 4 and observe B display. ARITH FREE indicator should be lit and all other indicators should be extinguished.
 - 1) If display is correct, refer to e).
 - 2) If ARITH FREE indicator is extinguished, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.
 - 3) If display is otherwise incorrect, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.

- e) Position rotary switch B at 5 and observe B display. ON-LINE indicator should be lit and all other indicators should be extinguished.
 - 1) If display is correct, refer to f).
 - 2) If ON-LINE indicator is extinguished, check CONSOLE OFF-LINE switch on maintenance panel for proper operation.
 - 3) If display is otherwise incorrect, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.
- f) Position rotary switch B at 6 and observe B display.
 - 1) If all indicators are extinguished, refer to g).
 - 2) If one or more indicators are lit, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.

NOTE

In g) and h) below, ignore ADDER ADD indicator which may or may not be lit.

- g) Position rotary switch B at 7 and observe B display.
 - 1) If all indicators are extinguished, refer to h).
 - 2) If one or more indicators are lit, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.
- h) Position rotary switch B at 8 and observe B display.
 - 1) If all indicators are extinguished, perform Step 10.
 - 2) If one or more indicators are lit, perform B Display Manual Test in paragraph 4-2a(3), page 4-13.

Step 10. Using rotary switch C, perform the operations specified in a) through h) below.

- a) Position rotary switch C at 1 and observe C display.
 - 1) If all indicators are extinguished, refer to b).
 - 2) If one or more indicators are lit, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
- b) Position rotary switch C at 2 and observe C display.
 - 1) For site configurations using a Model 35 Teletypewriter, only the second unlabeled indicator should be lit. If display is correct, refer to c); if display is incorrect, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
 - 2) For site configurations using an Incremental Printer, DØ REGISTER indicators 16 through 30 should be extinguished (ignore MARGIN SWITCH LEFT and RIGHT indicators). If correct, refer to c); if incorrect, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
- c) Position rotary switch C at 3 and observe C display. Only ARITHMETIC CONTROL SEQUENCES WR UP indicator should be lit.
 - 1) If display is correct, refer to d).
 - 2) If all indicators are extinguished, replace card A23.
 - 3) If display is otherwise incorrect, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
- d) Position rotary switch C at 4 and observe C display.
 - 1) If all indicators are extinguished, refer to e).
 - 2) If one or more indicators are lit, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
- e) Position rotary switch C at 5 and observe C display.

- 1) For site configurations using a Model 35 Teletypewriter, only SERIALIZER REGISTER (XØ) indicators 11 through 17 and INITL SEL UP indicator should be lit. If correct, refer to f); if incorrect, refer to C Display Manual Test in paragraph 4-2a(4), page 4-17.
- 2) For site configurations using an Incremental Printer, only CHARACTER COUNTER indicators 00 through 05 and INITL SEL UP indicator should be lit. If correct, refer to f); if incorrect, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
- f) Position rotary switch C at 6 and observe C display.
 - 1) If all indicators are extinguished, refer to g).
 - 2) If one or more indicators are lit, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
- g) Position rotary switch C at 7 and observe C display.
 - 1) If all indicators are extinguished, refer to h).
 - 2) If one or more indicators are lit, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.
- h) Position rotary switch C at 8 and observe C display.
 - 1) If all indicators are extinguished, perform Step 11.
 - 2) If one or more indicators are lit, perform C Display Manual Test in paragraph 4-2a(4), page 4-17.

Step 11. Using rotary switch D, perform the operations specified in a) through h) below.

- a) Position rotary switch D at 1 and observe D display.
 - 1) If all indicators are extinguished, refer to b).
 - 2) If one or more indicators are lit, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.
- b) Position rotary switch D at 2 and observe D display.
 - 1) If all indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.
- c) Position rotary switch D at 3 and observe D display.
 - 1) If all indicators are extinguished, refer to d).
 - 2) If one or more indicators are lit, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.
- d) Position rotary switch D at 4 and observe D display.
 - 1) If all indicators are extinguished, refer to e).
 - 2) If one or more indicators are lit, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.
- e) Position rotary switch D at 5 and observe D display. INITIAL LOAD ALLOW indicator should be lit and all other indicators should be extinguished.
 - 1) If display is correct, refer to f).
 - 2) If all indicators are extinguished, replace card C21.
 - 3) If display is otherwise incorrect, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.
- f) Position rotary switch D at 6 and observe D display.
 - 1) If all indicators are extinguished, refer to g).
 - 2) If one or more indicators are lit, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.
- g) Position rotary switch D at 7 and observe D display.
 - 1) If all indicators are extinguished, refer to h).
 - 2) If one or more indicators are lit, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.

- h) Position rotary switch D at 8 and observe D display.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, perform D Display Manual Test in paragraph 4-2a(5), page 4-21.

b. Instruction Rate Program Load Investigation. - The following procedure checks the conditions present after initially loading from the Multiplexer Channel while in the instruction mode.

- Step 1. Press STOP switch.
- Step 2. Press SYSTEM RESET switch.
- Step 3. Ensure program tape is positioned to load point on Multiplexer Channel loading device.
- Step 4. Press CLOCK RATE CLEAR switch.
- Step 5. Press CLOCK RATE INST indicator-switch.
- Step 6. Press LOAD switch.
- Step 7. Observe loading device.
 - a) If device is running, perform Step 8.
 - b) If device is not running, perform Step 9.
- Step 8. Press LOCAL switch on loading device and perform Step 9.
- Step 9. Observe LOGIC STOP indicators.
 - a) If all indicators are extinguished, perform Step 10.
 - b) If I/O PARITY CHECK indicator is lit, replace cards B16 and C46.
 - c) If STORAGE PARITY CHECK indicator is lit, refer to storage manual tests in paragraph 4-3b, page 4-119.
 - d) If INTERFACE CHECK indicator is lit, replace cards C05, C06 and C24.
 - e) If ADDRESS COMPARE indicator is lit, replace cards C47 and C54.
- Step 10. Position rotary switch D at 5 and observe INITIAL LOAD ALLOW and INITIAL LOAD WAIT indicators.
 - a) If both indicators are extinguished, perform Step 11.
 - b) If either indicator is lit, perform Initial Load Pretest in paragraph 3-2c, page 3-7.
- Step 11. Position rotary switch C at 1 and observe COND CODE indicators 34 and 35.
 - a) If both indicators are lit, perform Step 12.
 - b) If either or both indicators are extinguished, perform Step 39.
- Step 12. Observe LOAD NO DATA indicator.
 - a) If extinguished, perform Step 13.
 - b) If lit, perform Data Transfer Test in paragraph 3-2f, page 3-31.
- Step 13. Observe LOAD SUBSYSTEM CHECK indicator.
 - a) If lit, perform Step 14.
 - b) If extinguished, perform Data Transfer Test in paragraph 3-2f, page 3-31.
- Step 14. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 00002, perform Step 15.
 - b) If register equals any other value, perform Status Transfer Test in paragraph 3-2g, page 3-46.

- Step 15. Press RUN switch.
- Step 16. Position rotary switch D at 1 and observe PSW INSTRUCTION ADDRESS (PØ) indicators.
a) If register equals 00400, perform Step 17.
b) If register equals any other value, perform Step 22.
- Step 17. Observe LOAD SUBSYSTEM CHECK indicator.
a) If extinguished, perform Step 18.
b) If lit, perform Interrupt Sequence Test in paragraph 3-2h, page 3-50.
- Step 18. Position rotary switch C at 3 and observe ARITHMETIC CONTROL SE-QUENCER WR UP indicator.
a) If lit, perform Step 19.
b) If extinguished, perform Interrupt Sequence Test in paragraph 3-2h, page 3-50.
- Step 19. Press RUN switch.
- Step 20. Observe RUN indicator.
a) If extinguished, perform Step 21.
b) If lit, perform Interrupt Sequence Test in paragraph 3-2h, page 3-50.
- Step 21. Position rotary switch D at 2 and observe AØ REGISTER indicators.
a) If register equals OAOA, replace cards C21 and C27.
b) If register equals any other value, perform Step 28.
- Step 22. Press SYSTEM RESET switch.
- Step 23. Press MAINTENANCE READ switch to active position.
- Step 24. Position rotary switch D at 1, then set PSW INSTRUCTION ADDRESS (PØ) to 00400.
- Step 25. Press RUN switch.
- Step 26. Press MAINTENANCE READ switch to inactive position.
- Step 27. Position rotary switch C at 2 and observe DØ REGISTER indicators.
a) If register equals 9900, perform Status Transfer Test in paragraph 3-2g, page 3-46.
b) If register equals any other value, perform Step 29.
- Step 28. Position rotary switch D at 1 and observe PSW INSTRUCTION ADDRESS (PØ) indicators.
a) If register equals 00404, perform Initial Load Pretest in paragraph 3-2c, page 3-7.
b) If register equals any other value, perform Step 39.
- Step 29. Set LOAD ADDRESS CHANNEL NUMBER to 0.
- Step 30. Set LOAD ADDRESS CONTROL UNIT NUMBER to 8.
- Step 31. Set LOAD ADDRESS DEVICE NUMBER to 0.
- Step 32. Press SYSTEM RESET switch.
- Step 33. Press MAINTENANCE READ switch to active position.
- Step 34. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00400.
- Step 35. Press RUN switch.

- Step 36. At C display, observe DØ REGISTER indicators.
 a) If register equals 9900, perform Step 37.
 b) If register equals any other value, perform Status Transfer Test in paragraph 3-2g, page 3-46.
- Step 37. Press RUN switch.
- Step 38. At C display, observe DØ REGISTER indicators.
 a) If register equals OAOA, press MAINTENANCE READ switch to inactive position and perform Data Transfer Test in paragraph 3-2f, page 3-31.
 b) If register equals any other value, press MAINTENANCE READ switch to inactive position and perform Interrupt Sequence Test in paragraph 3-2h, page 3-50.
- Step 39. Press SYSTEM RESET switch.
- Step 40. Press CLOCK RATE CYCLE indicator-switch.
- Step 41. Set LOAD ADDRESS CHANNEL NUMBER to 0.
- Step 42. Set LOAD ADDRESS CONTROL UNIT NUMBER to 8.
- Step 43. Set LOAD ADDRESS DEVICE NUMBER to 0.
- Step 44. Press LOAD switch.
- Step 45. Press RUN switch nine times.
- Step 46. Position rotary switch A at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
 a) If register equals 80, perform Step 48.
 b) If register equals any other value, perform Step 47.
- Step 47. Position rotary switch D at 2 and observe AØ REGISTER indicators.
 a) If register equals 0080, replace cards C28 and C29.
 b) If register equals any other value, perform Initial Load Pretest in paragraph 3-2c.
- Step 48. Press RUN switch ten times.
- Step 49. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
 a) If register equals 02, replace cards C06, C14 and C24.
 b) If register equals any other value, replace cards C10 and B20.
- c. Initial Load Pretest. - The following procedure is performed to test the basic circuitry involved in an initial load operation.
- Step 1. Press SYSTEM RESET switch.
- Step 2. Observe LOGIC STOP INTERFACE CHECK indicator.
 a) If extinguished, perform Step 3.
 b) If lit, perform procedure in paragraph 3-2c(1), page 3-9.
- Step 3. Set LOAD ADDRESS CHANNEL NUMBER to 3.
- Step 4. Set LOAD ADDRESS CONTROL UNIT NUMBER to F.
- Step 5. Set LOAD ADDRESS DEVICE NUMBER to F.
- Step 6. Press LOAD switch.
- Step 7. Observe LOGIC STOP I/O PARITY CHECK indicator.
 a) If extinguished, perform Step 8.
 b) If lit, perform Step 9.

- Step 8. Observe LOGIC STOP INTERFACE CHECK indicator.
- If extinguished, perform Step 9.
 - If lit, probe card location C47, pin 48.
 - If MAINTENANCE PROBE indicator is lit, replace card C10.
 - If MAINTENANCE PROBE indicator is extinguished, refer to c).
 - Probe card location C47, pin 41.
 - If MAINTENANCE PROBE indicator is lit, replace card E43.
 - If MAINTENANCE PROBE indicator is extinguished, refer to d).
 - Probe card location C47, pin 39.
 - If MAINTENANCE PROBE indicator is lit, replace card D16.
 - If MAINTENANCE PROBE indicator is extinguished, refer to e).
 - Probe card location C47, pin 38.
 - If MAINTENANCE PROBE indicator is lit, replace card C47.
 - If MAINTENANCE PROBE indicator is extinguished, replace card C13.
- Step 9. Observe LOAD CHECK indicator.
- If lit, perform Step 10.
 - If extinguished, perform procedure in paragraph 3-2c(1), page 3-9.
- Step 10. Observe LOAD NO DATA indicator.
- If lit, perform Step 11.
 - If extinguished, perform procedure in paragraph 3-2c(2), page 3-10.
- Step 11. Position rotary switch C at 1 and observe PSW INTERRUPT MASK (P0) SEL1, SEL2, and MPX SH indicators.
- If all three indicators are lit, perform Step 17.
 - If one or more indicators are extinguished, perform Step 12.
- Step 12. Press SYSTEM RESET switch.
- Step 13. Press and then observe CLOCK RATE CYCLE indicator-switch.
- If lit, perform Step 14.
 - If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 14. Press LOAD switch.
- Step 15. Press RUN switch twice.
- Step 16. Position rotary switch D at 5 and observe INITIAL LOAD SEQUENCE 2 indicator.
- If lit, replace cards B39 and B41.
 - If extinguished, replace card C20.
- Step 17. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- If register equals 03FF, perform Step 18.
 - If register equals any other value, perform procedure in paragraph 3-2c(3), page 3-11.
- Step 18. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (S0) indicators.
- If register equals 00116, perform Step 11.
 - If register equals any other value, perform procedure in paragraph 3-2c(4), page 3-15.
- Step 19. At C display, observe COND CODE (P0) indicators 34 and 35.
- If both indicators are lit, perform Step 20.

- b) If either indicator is extinguished, perform procedure in paragraph 3-2c(5), page 3-17.
- Step 20. Observe LOAD WAIT indicator.
 - a) If extinguished, perform Step 21.
 - b) If lit, perform procedure in paragraph 3-2c(6), page 3-18.
- Step 21. Press SYSTEM RESET switch.
- Step 22. Press CLOCK RATE CYCLE indicator-switch.
- Step 23. Press LOAD switch.
- Step 24. Press RUN switch three times.
- Step 25. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 00170, perform Step 26.
 - b) If register equals any other value, replace cards C07, C10, C11 and B46.
- Step 26. Position rotary switch D at 3 and observe STOR WR CTRL WR UP and WR LOW indicators.
 - a) If both indicators are lit, perform Step 27.
 - b) If either indicator is extinguished, replace cards C07 and B16.
- Step 27. Press RUN switch.
- Step 28. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 00172, perform Step 29.
 - b) If register equals any other value, replace card C07.
- Step 29. At D display, observe STOR WR CTRL WR UP and WR LOW indicators.
 - a) If both indicators are lit, perform Step 30.
 - b) If either indicator is extinguished, replace cards C07 and B16.
- Step 30. Press RUN switch.
- Step 31. At D display, observe STOR WR CTRL WR UP and WR LOW indicators.
 - a) If both indicators are lit, perform Step 32.
 - b) If either indicator is extinguished, replace cards C07 and B16.
- Step 32. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 00114, perform Step 33.
 - b) If register equals any other value, replace cards C20, C21, C11 and C19.
- Step 33. Press RUN switch.
- Step 34. At D display, observe STOR WR CTRL WR UP and WR LOW indicators.
 - a) If both indicators are lit, perform Step 35.
 - b) If either indicator is extinguished, replace cards C07 and B16.
- Step 35. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 00116, perform Load Selection Sequence Test in paragraph 3-2d, page 3-19.
 - b) If register equals any other value, perform procedure in paragraph 3-2c(4), page 3-15.

(1) Initial load pretest, subtest 1. - This procedure is performed to isolate a malfunction detected by the Initial Load Pretest in paragraph 3-2c.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Position rotary switch D at 5 and observe INITIAL LOAD ALLOW indicator.
 - a) If lit, perform Step 3.

- b) If extinguished, perform Step 12.
- Step 3. Press CLOCK RATE CLEAR switch.
- Step 4. Press and hold LOAD switch while probing card location C21, pin 09.
 - a) If MAINTENANCE PROBE indicator is lit, perform Step 6.
 - b) If MAINTENANCE PROBE indicator is extinguished, continue holding in LOAD switch and perform Step 5.
- Step 5. While holding in LOAD switch, probe card location C21, pin 24.
 - a) If MAINTENANCE PROBE indicator is extinguished, replace card C21.
 - b) If MAINTENANCE PROBE indicator is lit, replace card C46.
- Step 6. Release LOAD switch.
- Step 7. Press CLOCK RATE CYCLE indicator-switch.
- Step 8. Press LOAD switch.
- Step 9. Press RUN switch.
- Step 10. At D display, observe INITIAL LOAD SEQUENCE 1 indicator.
 - a) If lit, replace cards C21 and C23.
 - b) If extinguished, perform Step 11.
- Step 11. Probe card location C20, pin 04.
 - a) If MAINTENANCE PROBE indicator is extinguished, replace cards C20 and C25.
 - b) If MAINTENANCE PROBE indicator is lit, replace cards C12 and C48.
- Step 12. At D display, observe INITIAL LOAD indicators.
 - a) If ALLOW indicator is extinguished, perform Step 13.
 - b) If LOAD indicator is lit, replace cards C21, C20 and C23.
 - c) If WAIT indicator is lit, replace cards C21, C20 and A23.
- Step 13. Press and hold SYSTEM RESET switch while probing card location C21, pin 27.
 - a) If MAINTENANCE PROBE indicator is lit, replace card C46.
 - b) If MAINTENANCE PROBE indicator is extinguished, replace cards C21 and C23.

(2) Initial load pretest, subtest 2. - The following procedure is performed to isolate a malfunction detected by the Initial Load Pretest in paragraph 3-2c.

- Step 1. Probe card location C46, pin 37.
 - a) If MAINTENANCE PROBE indicator is extinguished, perform Step 2.
 - b) If MAINTENANCE PROBE indicator is lit, replace card D42.
- Step 2. Probe card location C46, pin 38.
 - a) If MAINTENANCE PROBE indicator is extinguished, perform Step 3.
 - b) If MAINTENANCE PROBE indicator is lit, replace card C18.
- Step 3. Probe card location C46, pin 39.
 - a) If MAINTENANCE PROBE indicator is extinguished, perform Step 4.
 - b) If MAINTENANCE PROBE indicator is lit, replace card E47.
- Step 4. Probe card location C46, pin 30.
 - a) If MAINTENANCE PROBE indicator is extinguished, perform Step 5.
 - b) If MAINTENANCE PROBE indicator is lit, perform procedure in paragraph 3-2c(1), page 3-9.
- Step 5. Press SYSTEM RESET switch.
- Step 6. Press CLOCK RATE CLEAR switch.

- Step 7. Press CLOCK RATE CYCLE indicator-switch.
- Step 8. Press LOAD switch.
- Step 9. Press RUN switch.
- Step 10. Position rotary switch D at 5 and observe INITIAL LOAD SEQUENCE 1 indicator.
 - a) If lit, replace cards C46 and C22.
 - b) If extinguished, perform procedure in paragraph 3-2c(1), page 3-9.
- Step 11. Probe card location C46, pin 06.
 - a) If MAINTENANCE PROBE indicator is extinguished, replace card C46.
 - b) If MAINTENANCE PROBE indicator is lit, replace cards E14 and B58.

(3) Initial load pretest, subtest 3. - The following procedure is performed to isolate a malfunction detected by the Initial Load Pretest in paragraph 3-2c.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Press CLOCK RATE CLEAR switch.
- Step 3. Press CLOCK RATE CYCLE indicator-switch.
- Step 4. Press LOAD switch.
- Step 5. Press RUN switch twice.
- Step 6. Probe card location B60, pins 32, 36, 47 and 48, recording MAINTENANCE PROBE indication for each pin.
 - a) If MAINTENANCE PROBE indicator is extinguished for each pin, perform Step 7.
 - b) If MAINTENANCE PROBE indicator is lit for any pin, perform Step 21.
- Step 7. Probe card location B55, pins 06, 18, 32, 36, 47 and 48, recording MAINTENANCE PROBE indication for each pin.
 - a) If MAINTENANCE PROBE indicator is extinguished for each pin, perform Step 8.
 - b) If MAINTENANCE PROBE indicator is lit for any pin, perform Step 22.
- Step 8. Press RUN switch three times.
- Step 9. Position rotary switch D at 5 and observe INITIAL LOAD SEQUENCE 5 indicator.
 - a) If lit, perform Step 10.
 - b) If extinguished, replace card C20.
- Step 10. Probe Item 1 in Table 3-1, page 3-13.
- Step 11. Press RUN switch.
- Step 12. Position rotary switch D at 2 and observe A0 REGISTER indicators.
 - a) If register equals 03FF, probe Item 3 in Table 3-1, page 3-13.
 - b) If register equals any other value, perform Step 13.
- Step 13. Ensure rotary switch D is at 2 and observe A0 REGISTER indicators specified in a) through j) below.
 - a) A0 bit 15.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card B54.

- b) A0 bits 16 through 19.
 - 1) If they equal 0, refer to c).
 - 2) If they equal any other value, refer to h).
- c) A0 bits 20 through 23.
 - 1) If they equal 3, refer to d).
 - 2) If they equal any other value, perform Step 14.
- d) A0 bits 24 through 27.
 - 1) If they equal "F", refer to e).
 - 2) If they equal any other value, perform Step 18.
- e) A0 bit 28.
 - 1) If lit, refer to f).
 - 2) If extinguished, probe Item 9 in Table 3-1, page 3-13.
- f) A0 bit 29.
 - 1) If lit, refer to g).
 - 2) If extinguished, probe Item 9 in Table 3-1, page 3-13.
- g) A0 bit 30.
 - 1) If lit, replace card B55.
 - 2) If extinguished, probe Item 9 in Table 3-1, page 3-13.
- h) A0 bit 16.
 - 1) If extinguished, refer to i).
 - 2) If lit, probe Item 9 in Table 3-1, page 3-13.
- i) A0 bit 17.
 - 1) If extinguished, refer to j).
 - 2) If lit, probe Item 9 in Table 3-1, page 3-13.
- j) A0 bit 18.
 - 1) If extinguished, probe Item 8 in Table 3-1, page 3-13.
 - 2) If lit, probe Item 16 in Table 3-1, page 3-13.

Step 14. At D display, observe A0 REGISTER indicator 20.

- a) If lit, probe Item 9 in Table 3-1, page 3-13.
- b) If extinguished, perform Step 15.

Step 15. At D display, observe A0 REGISTER indicator 21.

- a) If lit, probe Item 9 in Table 3-1, page 3-13.
- b) If extinguished, perform Step 16.

Step 16. At D display, observe A0 REGISTER indicator 22.

- a) If lit, replace card B55.
- b) If extinguished, probe Item 17 in Table 3-1, page 3-14.

Step 17. At D display, observe A0 REGISTER indicators 28 through 31.

- a) If any indicators are lit, replace cards B24, B55 and B64.
- b) If all indicators are extinguished, replace cards B48 and B60.

Step 18. At D display, observe A0 REGISTER indicator 24.

- a) If lit, perform Step 19.
- b) If extinguished, probe Item 17 in Table 3-1, page 3-14.

Step 19. At D display, observe A0 REGISTER indicator 25.

- a) If lit, perform Step 20.
- b) If extinguished, probe Item 17 in Table 3-1, page 3-14.

Step 20. At D display, observe A0 REGISTER indicator 26.

- a) If lit, replace card B60.
- b) If extinguished, probe Item 17 in Table 3-1, page 3-14.

Step 21. When performing Step 6, was MAINTENANCE PROBE indicator extinguished for all pins?

- a) If yes, probe Item 20 in Table 3-1, page 3-14.

- b) If no, probe Item 24 in Table 3-1, page 3-14.
- Step 22. When performing Step 7, was MAINTENANCE PROBE indicator extinguished for all pins?
- a) If yes, probe Item 32 in Table 3-1, page 3-14.
- b) If no, probe Item 33 in Table 3-1, page 3-14.

Table 3-1. Initial Load Pretest, Subtest 3, Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	312	C08	12	If lit probe Item 2 If extinguished replace card C08
2	312	C08	13	If lit perform Step 11 of para 3-2c(3), page 3-11 If extinguished replace card C08
3	285	B45	36	If extinguished probe Item 4 If lit replace cards A38 and A55
4	285	B45	53	If extinguished probe Item 5 If lit replace card A30
5	285	B45	49	If extinguished probe Item 6 If lit replace card C08
6	285	B45	50	If extinguished probe Item 7 If lit replace card A30
7	285	B45	43	If extinguished replace card B45 If lit replace card A44
8	215	B60	18	If lit probe Item 9 If extinguished probe Item 14
9	285	B45	36	If extinguished probe Item 10 If lit probe Item 14
10	285	B45	37	If extinguished probe Item 11 If lit replace card A30
11	285	B45	49	If extinguished probe Item 12 If lit replace card C08
12	285	B45	48	If extinguished probe Item 13 If lit replace card A44
13	285	B45	50	If extinguished replace cards B45, B55 and B60 If lit replace card A43
14	286	B51	37	If extinguished probe Item 15 If lit replace card A24
15	286	B51	36	If extinguished replace cards B51, B55 and B60 If lit replace card C19
16	215	B60	06	If lit probe Item 9 If extinguished probe Item 14

Table 3-1. Initial Load Pretest, Subtest 3, Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
17	288	B24	07	If extinguished probe Item 18 If lit replace card A38
18	288	B24	08	If extinguished probe Item 19 If lit replace card C08
19	288	B24	09	If extinguished perform Step 17 of para 3-2c(3), page 3-12 If lit replace cards A30 and B24
20	292	B48	12	If extinguished probe Item 21 If lit replace card C07
21	240	B41	13	If extinguished probe Item 22 If lit replace card A24
22	292	B48	14	If extinguished probe Item 23 If lit replace card C46
23	292	B48	17	If lit replace card B51 If extinguished replace card B48
24	215	B60	53	If extinguished probe Item 25 If lit probe Item 28
25	215	B60	29	If extinguished probe Item 26 If lit probe Item 29
26	215	B60	54	If extinguished probe Item 27 If lit probe Item 30
27	215	B60	23	If extinguished replace card B60 If lit probe Item 31
28	118	E14	39	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
29	118	E14	38	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
30	118	E14	37	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
31	118	E14	12	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
32	292	B48	18	If extinguished replace card B48 If lit replace card B51
33	216	B55	53	If extinguished probe Item 34 If lit probe Item 39
34	216	B55	29	If extinguished probe Item 35 If lit probe Item 40

Table 3-1. Initial Load Pretest, Subtest 3, Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
35	216	B55	54	If extinguished probe Item 36 If lit probe Item 41
36	216	B55	23	If extinguished probe Item 37 If lit probe Item 42
37	216	B55	22	If extinguished probe Item 38 If lit probe Item 43
38	216	B55	03	If extinguished replace cards B51 and B55 If lit probe Item 44
39	118	E14	41	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
40	118	E14	15	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
41	118	E14	17	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
42	118	E14	18	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
43	118	E14	13	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches
44	118	E14	14	If lit replace card E14 If extinguished suspect LOAD ADDRESS switches

(4) Initial load pretest, subtest 4. - The following procedure is performed to isolate a malfunction detected by the Initial Load Pretest in paragraph 3-2c.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Press CLOCK RATE CLEAR switch.
- Step 3. Press CLOCK RATE CYCLE indicator-switch.
- Step 4. Press LOAD switch.
- Step 5. Press RUN switch four times.
- Step 6. Position rotary switch B at 2 and observe B0 REGISTER indicators.
 - a) If register equals 00114, perform Step 9.
 - b) If register equals any other value, probe the card locations and pins specified below and perform specified operation.

<u>Card Location</u>	<u>Pin</u>	<u>If MAINTENANCE PROBE Is Lit</u>	<u>If MAINTENANCE PROBE Is Extinguished</u>
C07	09	Replace card C07	Ignore
C07	11	Replace card C07	Ignore
C07	12	Replace card C07	Ignore
C07	26	Replace card C07	Ignore
C07	27	Replace card C07	Ignore
C07	30	Replace card C07	Ignore
C07	31	Replace card C07	Ignore
C07	53	Ignore	Replace card C07
C07	54	Ignore	Replace card C07
C08	30	Ignore	Replace card C07
C08	12	Perform Step 7	Replace card C07

- Step 7. At B display, observe BØ REGISTER indicators 16 through 23.
a) If only indicator 23 is lit, perform Step 8.
b) If any other indicator is lit, replace cards B28, B22 and A51.
- Step 8. At B display, observe BØ REGISTER indicators 24 through 27.
a) If only indicator 27 is lit, replace cards B26, B22 and A51.
b) If any other indicator is lit, replace cards B27, B22 and A51.
- Step 9. Press RUN switch.
- Step 10. Position rotary switch D at 2 and observe AØ REGISTER indicators.
a) If register equals 00114, perform Step 12.
b) If register equals any other value, probe Item 1 in Table 3-2, page 3-17.
- Step 11. At D display, observe AØ REGISTER indicators 16 through 19 and 24 through 27.
a) If bits 16 to 19 equal 0 and bits 24 to 27 equal 1, replace cards B55 and B45.
b) If any other condition exists, replace cards B60 and B45.
- Step 12. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (SØ) indicators.
a) If register equals 00114, perform Step 17.
b) If register equals any other value, probe Item 6 in Table 3-2, page 3-17.
- Step 13. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicator 15.
a) If extinguished, perform Step 14.
b) If lit, replace cards A33 and B54.
- Step 14. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators 16 through 20.
a) If they equal 0, perform Step 15.
b) If they equal any other value, replace cards B63 and A33.
- Step 15. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators 21 through 23.
a) If they equal 1, perform Step 16.
b) If they equal any other value, replace cards B51, B62, A33 and C11.

- Step 16. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators 24 through 27.
- If they equal 1, replace cards B51, B58, B59, C07, A33, and C11.
 - If they equal any other value, replace cards B56, B57, A33, B51 and C11.
- Step 17. Press RUN switch.
- Step 18. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
- If register equals 00116, replace cards C07 and C08.
 - If register equals any other value, replace cards C07, C08 and C11.

Table 3-2. Initial Load Pretest, Subtest 4, Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	285	B45	52	If extinguished probe Item 2 If lit replace card A38
2	285	B45	53	If extinguished probe Item 3 If lit replace card A30
3	285	B45	49	If extinguished probe Item 4 If lit replace card C08
4	285	B45	48	If extinguished probe Item 5 If lit replace card A44
5	285	B45	50	If extinguished perform Step 11 of para 3-2c(4), page 3-16 If lit replace card A30
6	312	C08	14	If lit probe Item 7 If extinguished replace card C08
7	312	C08	09	If lit perform Step 13 of para 3-2c(4), page 3-16 If extinguished replace card C08

(5) Initial load pretest, subtest 5. - The following procedure is performed to isolate a malfunction detected by the Initial Load Pretest in paragraph 3-2c.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Press CLOCK RATE CLEAR switch.
- Step 3. Press CLOCK RATE CYCLE indicator-switch.
- Step 4. Press LOAD switch.
- Step 5. Press RUN switch twice.
- Step 6. Observe LOAD NO DATA indicator.
 - If lit, perform Step 7.
 - If extinguished, perform procedure in paragraph 3-2c(2), page 3-10.
- Step 7. Press RUN switch four times.
- Step 8. Position rotary switch D at 5 and observe INITIAL LOAD SEQUENCE 6 indicator.
 - If lit, perform Step 9.

- b) If extinguished, replace card C20
- Step 9. Press RUN switch.
- Step 10. Observe LOAD WAIT.
a) If lit, probe Item 1 in Table 3-3.
b) If extinguished, probe Item 5 in Table 3-3.
- Step 11. Press RUN switch.
- Step 12. Position rotary switch B at 4 and observe LD COND CODE SEQ indicator.
a) If lit, probe Item 3 in Table 3-3.
b) If extinguished, replace cards C19 and C25.

Table 3-3. Initial Load Pretest, Subtest 5, Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	310	C11	23	If lit perform Step 12 of para 3-2c(5) If extinguished probe Item 2
2	310	C11	17	If lit replace card C11 If extinguished replace card C21
3	310	C11	07	If extinguished probe Item 4 If lit replace card C11
4	310	C11	08	If extinguished replace cards B41 and B47 If lit replace card C11
5	301	C21	40	If extinguished probe Item 6 If lit replace card C46
6	301	C21	05	If extinguished probe Item 7 If lit replace card D12
7	301	C21	06	If extinguished probe Item 8 If lit replace card E31
8	301	C21	07	If extinguished replace cards C21 and C23 If lit replace card C19

(6) Initial load pretest, subtest 6. - The following procedure is performed to isolate a malfunction detected by the Initial Load Pretest in paragraph 3-2c.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Press CLOCK RATE CLEAR switch.
- Step 3. Press CLOCK RATE CYCLE indicator-switch.
- Step 4. Press LOAD switch.
- Step 5. Press RUN switch six times.
- Step 6. Position rotary switch D at 5 and observe INITIAL LOAD SEQUENCE indicator.
a) If lit, perform Step 7.
b) If extinguished, perform Step 11.

- Step 7. Press RUN switch.
- Step 8. Observe LOAD WAIT indicator.
 a) If lit, perform Step 9.
 b) If extinguished, probe Item 3 in Table 3-4.
- Step 9. Press RUN switch.
- Step 10. Position rotary switch B at 4 and observe LD COND CODE SEQ indicator.
 a) If lit, replace cards C21 and C23.
 b) If extinguished, probe Item 1 in Table 3-4.
- Step 11. Observe LOAD CHECK indicator.
 a) If lit, replace cards C25 and C20.
 b) If extinguished, replace cards C21 and C23.

Table 3-4. Initial Load Pretest, Subtest 6, Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	310	C11	17	If lit probe Item 2 If extinguished replace cards C21 and C23
2	310	C11	23	If lit replace cards C19 and C25 If extinguished replace card C11
3	301	C21	40	If extinguished probe Item 4 If lit replace card C46
4	301	C21	05	If extinguished probe Item 5 If lit replace card D12
5	301	C21	06	If extinguished probe Item 6 If lit replace card E31
6	301	C21	07	If extinguished replace cards C21 and C23 If lit replace card C19

d. Load Selection Sequence Test. - The following procedure checks the logic circuitry involved in the first six sequences of a Multiplexer Channel initial load.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Set LOAD ADDRESS CHANNEL NUMBER to 0.
- Step 3. Set LOAD ADDRESS CONTROL UNIT NUMBER to 8.
- Step 4. Set LOAD ADDRESS DEVICE NUMBER to 0.
- Step 5. Press and then observe CLOCK RATE CYCLE indicator-switch.
 a) If lit, perform Step 6.
 b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 6. Press and then observe CYCLE COUNT indicator-switch.
 a) If lit, perform Step 7.
 b) If extinguished, perform Cycle Counter Manual Test in paragraph 4-2e, page 4-46.

- Step 7. Position rotary switch A at 2.
- Step 8. Press A display CLEAR switch, then set CLOCK CYCLE COUNTER (MØ) to 07.
- Step 9. Press LOAD switch.
- Step 10. Press RUN switch.
- Step 11. At A display, observe CLOCK CYCLE COUNTER (MØ) indicators.
- If register equals 00, perform Step 12.
 - If register equals any other value, perform Cycle Counter Manual Test in paragraph 4-2e, page 4-46.
- Step 12. Press CYCLE COUNT CLEAR switch.
- Step 13. Position rotary switch B at 4 and observe B display indicators specified in a) through d) below.
- ARITH FREE indicator.
 - If lit, press RUN switch and refer to b).
 - If extinguished, replace card C21.
 - START I/O SEQ 1 indicator.
 - If lit, refer to c) below.
 - If extinguished, perform Step 14.
 - CHAN ACT indicator.
 - If lit, press RUN switch and refer to d).
 - If extinguished, probe Item 11 in Table 3-5, page 3-27.
 - START I/O SEQ 2 indicator.
 - If lit, perform Step 15.
 - If extinguished, replace cards C17 and C25.
- Step 14. At B display, observe START I/O SEQ 2 and 3 indicators.
- If both indicators are extinguished, probe Item 1 in Table 3-5, page 3-26.
 - If either indicator is lit, replace card C23.
- Step 15. Position rotary switch D at 4 and observe START I/O indicator.
- If lit, perform Step 17.
 - If extinguished, perform Step 16.
- Step 16. At B display, observe LD COND CODE SEQ indicator.
- If extinguished, replace cards C12 and C23.
 - If lit, probe Item 53 in Table 3-5, page 3-29.
- Step 17. Position rotary switch A at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
- If register equals 80, perform Step 18.
 - If register equals any other value, perform Step 61.
- Step 18. Ensure rotary switch B is at 4 and observe B display indicators specified in a) through d) below.
- START I/O SEQ 1 indicator.
 - If extinguished, press RUN switch and refer to b).
 - If lit, refer to d).
 - START I/O SEQ 3 indicator.
 - If lit, refer to c).
 - If extinguished, replace cards C17 and C25.
 - START I/O SEQ 2 indicator.
 - If extinguished, perform Step 19.
 - If lit, replace cards C17 and C25.

- d) CHAN ACT indicator.
 - 1) If extinguished, replace card B17.
 - 2) If lit, replace card C14.
- Step 19. At D display, observe ADR OUT indicator.
 - a) If lit, perform Step 20.
 - b) If extinguished, replace cards C22 and C13.
- Step 20. Ensure rotary switch B is at 4 and observe B display indicators specified in a) through c) below.
 - a) CHAN ACT indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, probe Item 54 in Table 3-5, page 3-29.
 - b) LD COND CODE SEQ indicator.
 - 1) If extinguished, press RUN switch and refer to c).
 - 2) If lit, replace cards C17 and C25.
 - c) START I/O SEQ 3 indicator.
 - 1) If extinguished, perform Step 21.
 - 2) If lit, replace cards C17 and C25.
- Step 21. At D display, observe SEL OUT indicator.
 - a) If extinguished, perform Step 22.
 - b) If lit, perform Step 23.
- Step 22. At D display, observe START I/O indicator.
 - a) If extinguished, replace cards C11 and C12.
 - b) If lit, probe Item 56 in Table 3-5, page 3-29.
- Step 23. Press RUN switch.
- Step 24. Position rotary switch C at 4 and observe C display indicators specified in a) through c) below.
 - a) SEL IN indicator.
 - 1) If extinguished, press RUN switch and refer to b).
 - 2) If lit, perform Step 65.
 - b) SEL IN indicator.
 - 1) If extinguished, press RUN switch and refer to c).
 - 2) If lit, perform Step 65.
 - c) OPL IN indicator.
 - 1) If lit, press RUN switch and perform Step 25.
 - 2) If extinguished, probe Item 63 in Table 3-5, page 3-29.
- Step 25. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS ADR OUT indicator.
 - a) If extinguished, perform Step 26.
 - b) If lit, replace card C13.
- Step 26. At B display, observe CHAN ACT indicator.
 - a) If lit, perform Step 27.
 - b) If extinguished, replace card C13.
- Step 27. Press RUN switch.
- Step 28. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS ADR IN indicator.
 - a) If lit, perform Step 29.
 - b) If extinguished, replace card C13.
- Step 29. Press RUN switch.

- Step 30. At B display, observe LD DEV ADR SEQ indicator.
a) If lit, perform Step 31.
b) If extinguished, probe Item 69 in Table 3-5, page 3-
- Step 31. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SEL OUT indicator.
a) If extinguished, perform Step 32.
b) If lit, probe Item 68 in Table 3-5, page 3-30.
- Step 32. Ensure rotary switch B is at 4 and observe B display indicators specified in a) through c) below.
a) LD I/O REG SEQ indicator.
1) If extinguished, press RUN switch and refer to b).
2) If lit, replace cards C25 and C18.
b) LD DEV ADR SEQ indicator.
1) If extinguished, refer to c).
2) If lit, probe Item 69 in Table 3-5, page 3-30.
c) LD I/O REG SEQ indicator.
1) If lit, perform Step 33.
2) If extinguished, probe Item 72 in Table 3-5, page 3-30.
- Step 33. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
a) If register equals 80 and PAR indicator is extinguished, press RUN switch and perform Step 34.
b) If register does not equal 80 or PAR indicator is lit, probe Item 74 in Table 3-5, page 3-30.
- Step 34. At B display, observe the following indicators.
a) ACK SEQ indicator.
1) If lit, refer to b).
2) If extinguished, replace cards C18 and C10.
b) LD I/O REG SEQ indicator.
1) If extinguished, perform Step 35.
2) If lit, replace cards C10 and C28.
- Step 35. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
a) If register equals 02 and PAR indicator is extinguished, press RUN switch and perform Step 36.
b) If register does not equal 02 or PAR indicator is lit, replace cards C10 and C28.
- Step 36. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS CMD OUT indicator.
a) If lit, perform Step 37.
b) If extinguished, replace card C13.
- Step 37. At B display, observe the following indicators.
a) ACK SEQ indicator.
1) If extinguished, refer to b).
2) If lit, replace cards C10 and C28.
b) LD DEV ADR SEQ indicator.
1) If extinguished, press RUN switch and perform Step 38.
2) If lit, replace cards C10 and C28.
- Step 38. Observe READ indicator on console.
a) If lit, press RUN switch and perform Step 40.
b) If extinguished, perform Step 39.

- Step 39. Position rotary switch A at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (C0) indicators.
- If register equals 02 and PAR indicator is extinguished, replace cards C24 and C23.
 - If register does not equal 02 or PAR indicator is lit, replace cards C10, B46 and B20.
- Step 40. Ensure rotary switches C and D are at 4.
- At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS ADR IN indicator; at D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS CMD OUT indicator.
 - If both indicators are extinguished, press RUN switch twice and perform Step 41.
 - If either indicator is lit, replace card C13.
- Step 41. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS STA IN indicator.
- If lit, perform Step 42.
 - If extinguished, replace card C13.
- Step 42. At B display, observe the indicators specified in a) through g) below.
- REQUEST STATUS indicator.
 - If lit, refer to b).
 - If extinguished, probe Item 80 in Table 3-5, page 3-30.
 - REQUEST ARITH indicator.
 - If lit, press RUN switch and refer to c).
 - If extinguished, probe Item 83 in Table 3-5, page 3-30.
 - LD I/O REG SEQ indicator.
 - If lit, refer to d).
 - If extinguished, refer to f).
 - ARITH LOCKOUT indicator.
 - If lit, refer to e).
 - If extinguished, refer to g).
 - REQUEST ARITH indicator.
 - If extinguished, perform Step 43.
 - If lit, replace card C14.
 - ARITH LOCKOUT indicator.
 - If extinguished, replace card C11.
 - If lit, replace card C10.
 - LD I/O REG SEQ indicator.
 - If extinguished, replace card C11.
 - If lit, probe Item 84 in Table 3-5, page 3-30.
- Step 43. Observe LOAD SUBSYSTEM CHECK indicator.
- If extinguished, press RUN switch and perform Step 44.
 - If lit, replace card C12.
- Step 44. At B display, observe the following indicators.
- ACK SEQ indicator.
 - If lit, refer to b).
 - If extinguished, replace card C10.
 - STA TRANS indicator.
 - If lit, perform Step 45.
 - If extinguished, replace cards C10 and C20.
- Step 45. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (C0) indicators.
- If register equals 00 and PAR indicator is lit, perform Step 50.

- b) If register does not equal 00 or PAR indicator is extinguished, perform Step 46.
- Step 46. At console, observe READ indicator.
 - a) If lit, perform Step 47.
 - b) If extinguished, replace card C24.
- Step 47. Probe card location C10, pin 48.
 - a) If MAINTENANCE PROBE indicator is extinguished, replace card C10.
 - b) If MAINTENANCE PROBE indicator is lit, probe card location C10, pin 31.
 - 1) If MAINTENANCE PROBE indicator is extinguished, perform Step 48.
 - 2) If MAINTENANCE PROBE indicator is lit, replace card C10.
- Step 48. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (C0) PAR indicator.
 - a) If lit, perform Step 49.
 - b) If extinguished, replace cards C10, C22 and C27.
- Step 49. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (C0) indicators 00 through 03.
 - a) If one or more indicators are lit, replace cards C10 and C29.
 - b) If all indicators are extinguished, replace cards C10 and C28.
- Step 50. Observe LOGIC STOP I/O PARITY CHECK indicator.
 - a) If extinguished, perform Step 53.
 - b) If lit, replace cards C22 and C27.
- Step 51. At B display, observe indicators specified in a) through f) below.
 - a) ARITH LOCKOUT indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace cards C17 and B17.
 - b) LD I/O REG SEQ indicator.
 - 1) If extinguished, press RUN switch and refer to c).
 - 2) If lit, replace card C10.
 - c) WR DEV NUM SEQ indicator.
 - 1) If extinguished, press RUN switch twice and refer to d).
 - 2) If lit, replace card C20.
 - d) STA TRANS indicator.
 - 1) If extinguished, refer to e).
 - 2) If lit, replace card C20.
 - e) LD COND CODE SEQ indicator.
 - 1) If lit, refer to f).
 - 2) If extinguished, replace cards C11 and C19.
 - f) ACK SEQ indicator.
 - 1) If extinguished, perform Step 52.
 - 2) If lit, replace card C10.
- Step 52. At D display, observe the following indicators.
 - a) MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SRV OUT indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace card C13.
 - b) ZERO STA indicator.
 - 1) If lit, press RUN switch and perform Step 55.
 - 2) If extinguished, perform Step 53.
- Step 53. Press SYSTEM RESET switch.

- Step 54. Ensure rotary switch A is at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (C0) indicators.
- a) If register equals 00, probe Item 85 in Table 3-5, page 3-30.
 - b) If register equals any other value, perform Step 58.
- Step 55. At B display, observe LD COND CODE SEQ indicator.
- a) If extinguished, press RUN switch twice and perform Step 56.
 - b) If lit, replace cards C11 and C19.
- Step 56. At D display, observe START I/O indicator.
- a) If extinguished, perform Step 57.
 - b) If lit, replace card C12.
- Step 57. At B display, observe the indicators specified in a) through c) below.
- a) REQUEST STATUS indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace cards B17, C23 and C14.
 - b) ARITH LOCKOUT indicator.
 - 1) If extinguished, refer to c).
 - 2) If lit, replace cards B17 and C17.
 - c) WR DEV NUM SEQ indicator.
 - 1) If extinguished, press RUN switch twice and perform Step 58.
 - 2) If lit, replace card C20.
- Step 58. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS OPL IN and STA IN indicators.
- a) If extinguished, perform Step 59.
 - b) If lit, replace card C13.
- Step 59. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SRV OUT indicator.
- a) If extinguished, perform Step 60.
 - b) If lit, replace card C13.
- Step 60. At B display, observe CHAN ACT indicator.
- a) If extinguished, perform Channel Interface Test in paragraph 3-2e, page 3-31.
 - b) If lit, replace cards C14 and B17.
- Step 61. Press SYSTEM RESET switch.
- Step 62. Press CLOCK RATE CYCLE indicator-switch.
- Step 63. Press LOAD switch.
- Step 64. Press RUN switch twice, then probe Item 13 in Table 3-5, page 3-27.
- Step 65. Position rotary switch D at 4 and observe START I/O indicator.
- a) If lit, perform Step 67.
 - b) If extinguished, perform Step 66.
- Step 66. Position rotary switch B at 4 and observe LD COND CODE SEQ indicator.
- a) If lit, replace card C11.
 - b) If extinguished, replace card C12.
- Step 67. At D display observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SEL OUT indicator.
- a) If extinguished, perform Step 68.
 - b) If lit, replace card C17.

- Step 68. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS ADR OUT indicator.
 a) If extinguished, perform Step 69.
 b) If lit, probe Item 60 in Table 3-5, page 3-29.
- Step 69. Position rotary switch C at 4 and observe MULTIPLEXER INPUT INTER-FACE TAGS AND CONTROLS OPL IN indicator.
 a) If lit, suspect a terminal device on the channel.
 b) If extinguished, replace card C13.
- Step 70. Ensure rotary switch B is at 4 and perform the following:
 a) Press SYSTEM RESET switch.
 b) Press CLOCK RATE CLEAR switch.
 c) At B display, press LD DEV ADR SEQ indicator-switch.
 d) Probe Item 73 in Table 3-5, page 3-30.
- Step 71. Ensure rotary switch D is at 5 and perform the following:
 a) Press SYSTEM RESET switch.
 b) Press CLOCK RATE CLEAR switch.
 c) Press CLOCK PHASE CLEAR switch.
 d) At D display, press INITIAL LOAD SEQ 2 indicator-switch.
 e) Probe Item 47 in Table 3-5, page 3-28.
- Step 72. Ensure rotary switch B is at 4 and perform the following:
 a) Press SYSTEM RESET switch.
 b) Press CLOCK RATE CLEAR switch.
 c) At B display, press START I/O SEQ 3 indicator-switch.
 d) Probe Item 59 in Table 3-5, page 3-29.
- Step 73. Ensure rotary switch B is at 4 and perform the following:
 a) Press SYSTEM RESET switch.
 b) Press CLOCK RATE CLEAR switch.
 c) At B display, press LD DEV ADR indicator-switch.
 d) Probe Item 78 in Table 3-5, page 3-30.

Table 3-5. Load Selection Sequence Test Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	305	C17	13	If extinguished probe Item 2 If lit replace card C12
2	307	C14	24	If extinguished probe Item 4 If lit probe Item 3
3	307	C14	38	If extinguished replace card C14 If lit replace cards C17 and C25
4	301	C21	18	If extinguished probe Item 6 If lit probe Item 5
5	301	C21	17	If extinguished probe Item 9 If lit replace card C21
6	216	B55	03	If extinguished probe Item 7 If lit probe Item 8
7	118	E14	14	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches

Table 3-5. Load Selection Sequence Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
8	216	B55	25	If extinguished replace card B51 If lit replace card B55
9	216	B55	22	If extinguished probe Item 10 If lit probe Item 8
10	118	E14	13	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches
11	307	C14	37	If extinguished replace card C17 If lit probe Item 2
12	307	C14	49	If extinguished replace card B17 If lit replace cards C14 and C22
13	215	B60	32	If extinguished probe Item 14 If lit probe Item 17
14	215	B60	47	If extinguished probe Item 23 If lit probe Item 15
15	215	B60	36	If extinguished probe Item 25 If lit probe Item 16
16	215	B60	48	If extinguished probe Item 27 If lit probe Item 29
17	313	C07	14	If extinguished replace cards B48 and C07 If lit probe Item 18
18	292	B48	12	If extinguished probe Item 19 If lit replace cards C07 and B48
19	292	B48	14	If extinguished probe Item 20 If lit replace card C46
20	292	B48	13	If extinguished probe Item 21 If lit replace card A24
21	215	B60	23	If extinguished replace cards B60, B51 and C07 If lit probe Item 22
22	118	E14	12	If extinguished suspect LOAD ADDRESS switches If lit replace card E14
23	215	B60	54	If extinguished probe Item 24 If lit replace cards B60, B51 and C07
24	118	E14	37	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches
25	215	B60	29	If extinguished probe Item 26 If lit replace cards B60, B51 and C07
26	118	E14	38	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches
27	215	B60	53	If extinguished probe Item 28 If lit replace cards B60, B51 and C07

Table 3-5. Load Selection Sequence Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
28	118	E14	39	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches
29	216	B55	32	If extinguished probe Item 33 If lit probe Item 30
30	216	B55	47	If extinguished probe Item 35 If lit probe Item 31
31	216	B55	36	If extinguished probe Item 36 If lit probe Item 32
32	216	B55	48	If extinguished probe Item 37 If lit press RUN switch and probe Item 39
33	216	B55	23	If extinguished probe Item 34 If lit replace cards B55, B51 and C07
34	118	E14	18	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches
35	216	B55	54	If extinguished probe Item 36 If lit replace cards B55, B51 and C07
36	118	E14	17	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches
37	216	B55	53	If extinguished probe Item 38 If lit replace cards B55, B51 and C07
38	118	E14	41	If extinguished replace card E14 If lit suspect LOAD ADDRESS switches
39	272	C29	35	If extinguished probe Item 40 If lit probe Item 43
40	272	C29	06	If extinguished probe Item 46 If lit probe Item 41
41	272	C29	26	If extinguished probe Item 46 If lit probe Item 42
42	272	C29	15	If extinguished probe Item 46 If lit probe Item 48
43	272	C29	30	If extinguished replace card B46 If lit probe Item 44
44	294	B46	08	If extinguished probe Item 45 If lit replace card C48
45	294	B46	09	If extinguished probe Item 46 If lit replace card C10
46	272	C29	50	If extinguished replace card B46 If lit perform Step 71 of para 3-2d, page 3-26
47	311	C10	15	If extinguished replace card C10 If lit replace cards B46 and C29

Table 3-5. Load Selection Sequence Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
48	273	C28	35	If extinguished replace cards C28 and B20 If lit probe Item 49
49	273	C28	06	If extinguished replace cards C28 and B20 If lit probe Item 50
50	273	C28	26	If extinguished replace cards C28 and B20 If lit probe Item 51
51	273	C28	26	If extinguished replace cards C28 and B20 If lit press RUN switch five times and probe Item 52
52	311	C10	17	If extinguished replace cards C10 and C14 If lit replace cards C28, C29, B20 and B46
53	303	C19	40	If extinguished replace card C19 If lit replace card C11
54	314	B17	53	If extinguished replace card C13 If lit probe Item 55
55	314	B17	12	If extinguished replace card B17 If lit replace card C14
56	310	C11	09	If extinguished replace card C11 If lit probe Item 57
57	305	C17	23	If extinguished replace cards C17 and C23 If lit probe Item 58
58	305	C17	12	If extinguished replace card C11 If lit perform Step 72 of para 3-2d, page 3-26
59	305	C17	05	If extinguished replace cards C17 and C22 If lit replace card C14
60	294	B46	08	If extinguished probe Item 61 If lit replace card C48
61	294	B46	09	If extinguished probe Item 62 If lit replace card C10
62	294	B46	13	If extinguished replace cards B46 and C24 If lit replace card C10
63	305	C17	53	If extinguished replace card C17 If lit probe Item 64
64	275	C06	40	If extinguished probe Item 65 If lit replace card C06
65	275	C06	52	If extinguished probe Item 66 If lit replace card C06
66	271	C05	52	If extinguished probe Item 67 If lit suspect I/O cable or terminal device

Table 3-5. Load Selection Sequence Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
67	271	C05	38	If extinguished replace card C05 If lit replace cards C13 and C22
68	310	C11	09	If extinguished replace card C17 If lit replace card C11
69	303	C19	04	If extinguished probe Item 70 If lit replace card C12
70	303	C19	29	If extinguished probe Item 71 If lit replace cards C19 and C25
71	311	C10	36	If extinguished replace card C10 If lit replace card C13
72	304	C18	04	If lit replace card C12 If extinguished perform Step 70 of para 3-2d, page 3-26
73	311	C10	49	If extinguished replace card C10 If lit replace cards C18 and C25
74	311	C10	48	If extinguished replace card C10 If lit probe Item 75
75	311	C10	31	If extinguished probe Item 76 If lit replace card C10
76	311	C10	17	If extinguished probe Item 77 If lit replace card C10
77	311	C10	13	If lit replace card C10 If extinguished perform Step 73 of para 3-2d, page 3-
78	311	C10	48	If extinguished probe Item 79 If lit replace card C10
79	311	C10	31	If extinguished replace card C10 If lit replace cards B22, C28, C29 and B20
80	307	C14	02	If extinguished replace card B17 If lit probe Item 81
81	308	C13	13	If extinguished probe Item 82 If lit replace card C13
82	311	C10	12	If extinguished replace card C14 If lit replace card C10
83	307	C14	20	If extinguished replace card C14 If lit replace card C11
84	314	B17	23	If extinguished replace card B17 If lit replace card C17
85	274	C27	48	If extinguished replace card C12 If lit replace card C27

e. Channel Interface Test. - The following procedure checks the interface circuitry between the console and 9400 processor.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Set LOAD ADDRESS CHANNEL NUMBER to 0.
- Step 3. Set LOAD ADDRESS CONTROL UNIT NUMBER to 8.
- Step 4. Set LOAD ADDRESS DEVICE NUMBER to 0.
- Step 5. Press LOAD switch.
- Step 6. Observe LOGIC STOP INTERFACE CHECK indicator.
 - a) If extinguished, perform Step 7.
 - b) If lit, replace cards C10, D16 and E43. If card replacement does not correct the malfunction, suspect loading device control unit.
- Step 7. Press any numeric character key on console keyboard.
- Step 8. Observe LOGIC STOP INTERFACE CHECK indicator.
 - a) If extinguished, perform Step 9.
 - b) If lit, perform Data Transfer Test in paragraph 3-2f.
- Step 9. Observe LOAD NO DATA indicator.
 - a) If extinguished, replace cards C05, C13 and C14.
 - b) If lit, perform Data Transfer Test in paragraph 3-2f.

f. Data Transfer Test. - The data transfer test checks the transfer of data from the console to the 9400 processor while cycling through the transfer.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Set LOAD ADDRESS CHANNEL NUMBER to 0.
- Step 3. Set LOAD ADDRESS CONTROL UNIT NUMBER to 8.
- Step 4. Set LOAD ADDRESS DEVICE NUMBER to 0.
- Step 5. Press CLOCK RATE CLEAR switch.
- Step 6. Press the CLOCK RATE CYCLE indicator-switch.
- Step 7. Press LOAD switch.
- Step 8. Press "7" key on console.
- Step 9. Position rotary switch B at 4 and observe the following B display indicators.
 - a) CHAN ACT indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, perform Step 10.
 - b) REQUEST STATUS indicator.
 - 1) If extinguished, perform Step 12.
 - 2) If lit, probe Item 96 in Table 3-6, page 3-45.
- Step 10. Position rotary switch D at 4 and observe START I/O indicator.
 - a) If extinguished, perform Step 11.
 - b) If lit, replace cards C17 and B17.
- Step 11. At B display, observe REQUEST TIMER indicator.
 - a) If extinguished, probe Item 92 in Table 3-6, page 3-45.
 - b) If lit, replace cards C14 and B17.

- Step 12. Press RUN switch.
- Step 13. Position rotary switch C at 4 and observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS REQ IN indicator.
- a) If lit, perform Step 14.
 - b) If extinguished, probe card location C17, pin 52.
 - 1) If MAINTENANCE PROBE indicator is lit, replace cards C17 and C23.
 - 2) If MAINTENANCE PROBE indicator is extinguished, replace card E11.
- Step 14. Press RUN switch.
- Step 15. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SEL OUT indicator.
- a) If extinguished, probe Item 1 in Table 3-6, page 3-41.
 - b) If lit, perform Step 18.
- Step 16. At D display, observe START I/O indicator.
- a) If extinguished, perform Step 17.
 - b) If lit, replace card C12.
- Step 17. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS SEL IN indicator.
- a) If extinguished, replace card C11.
 - b) If lit, replace card C13.
- Step 18. At B display, observe the following indicators.
- a) CHAN ACT indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, perform Step 20.
 - b) ARITH FREE indicator.
 - 1) If lit, perform Step 21.
 - 2) If extinguished, perform Step 19.
- Step 19. Observe LOAD WAIT indicator.
- a) If extinguished, perform Step 20.
 - b) If lit, replace card C21.
- Step 20. Ensure rotary switch C is at 4 and observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS SEL IN indicator.
- a) If extinguished, probe Item 7 in Table 3-6, page 3-41.
 - b) If lit, perform Step 21.
- Step 21. Press RUN switch three times.
- Step 22. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS indicators specified in a) through c) below.
- a) REQ IN indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card C17.
 - b) OPL IN indicator.
 - 1) If lit, press RUN switch and refer to c).
 - 2) If extinguished, replace cards C13 and C22.
 - c) ADR IN indicator.
 - 1) If lit, perform Step 23.
 - 2) If extinguished, replace card C13.
- Step 23. Press RUN switch.

- Step 24. At B display, observe FAST ACK SEQ indicator.
a) If extinguished, probe Item 10 in Table 3-6, page 3-41.
b) If lit, perform Step 26.
- Step 25. Position rotary switch A at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (C0) indicators.
a) If register equals 80, perform Step 28.
b) If register equals any other value, perform Step 26.
- Step 26. At A display, observe that MULTIPLEXER I/O BUFFER REGISTER (C0) bit 00 is lit and bits 01 through 07 are extinguished.
a) If all bits are correct, perform Step 27.
b) If any bit is incorrect, replace cards C29, B20 and C04.
- Step 27. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (C0) PAR indicator.
a) If lit, replace cards C29, B20 and C04.
b) If extinguished, perform Status Transfer Test in paragraph 3-2g, page 3-46.
- Step 28. At B display, observe ACK SEQ indicator.
a) If lit, perform Step 29.
b) If extinguished, replace cards C10 and C18.
- Step 29. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SEL OUT indicator.
a) If extinguished, perform Step 30.
b) If lit, probe Item 12 in Table 3-6, page 3-41.
- Step 30. Press RUN switch.
- Step 31. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS CMD OUT indicator.
a) If lit, perform Step 32.
b) If extinguished, replace cards C13 and C20.
- Step 32. At B display, observe the following indicators.
a) ACK SEQ indicator.
1) If extinguished, refer to b).
2) If lit, replace card C10.
b) FAST ACK SEQ indicator.
1) If extinguished, perform Step 33.
2) If lit, replace cards C10 and B16.
- Step 33. Press RUN switch twice.
- Step 34. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS ADR IN indicator.
a) If extinguished, perform Step 37.
b) If lit, replace cards C22, C13 and B16.
- Step 35. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS CMD OUT indicator.
a) If extinguished, perform Step 36.
b) If lit, replace cards C13 and C22.
- Step 36. Press RUN switch twice.
- Step 37. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS SRV IN indicator.
a) If extinguished, replace card C13.
b) If lit, perform Step 38.

- Step 38. At B display, observe the indicators specified in a) through f) below.
- a) REQUEST DATA indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, probe Item 13 in Table 3-6, page 3-41.
 - b) REQUEST ARITH indicator.
 - 1) If lit, refer to c).
 - 2) If extinguished, replace card C14.
 - c) ARITH FREE indicator.
 - 1) If lit, refer to d).
 - 2) If extinguished, return to Step 19.
 - d) CHAN ACT indicator.
 - 1) If lit, press RUN switch and refer to e).
 - 2) If extinguished, replace card B17.
 - e) ARITH LOCKOUT indicator.
 - 1) If lit, refer to g).
 - 2) If extinguished, perform Step 39.
 - f) REQUEST ARITH indicator.
 - 1) If extinguished, perform Step 41.
 - 2) If lit, replace card C14.
- Step 39. At B display, observe WR DEV NUM SEQ indicator.
- a) If lit, perform Step 41.
 - b) If extinguished, perform Step 40.
- Step 40. At C display, observe the indicators specified in a) through c) below.
- a) RD ADR indicator.
 - 1) If lit, perform Step 41.
 - 2) If extinguished, refer to b).
 - b) WR FLAGS indicator.
 - 1) If lit, perform Step 41.
 - 2) If extinguished, refer to c).
 - c) DATA TRANS 3 indicator.
 - 1) If lit, perform Step 41.
 - 2) If extinguished, probe Item 97 in Table 3-6, page 3-45.
- Step 41. At C display, observe RD BCW INDEX indicator.
- a) If extinguished, replace cards C11, C19 and B17.
 - b) If lit, perform Step 42.
- Step 42. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (SØ) indicators.
- a) If register equals 00102, perform Step 43.
 - b) If register equals any other value, probe Item 16 in Table 3-6, page 3-41.
- Step 43. At C display, observe RD FLAGS indicator.
- a) If extinguished, perform Step 44.
 - b) If lit, replace cards C25 and C19.
- Step 44. Press RUN switch.
- Step 45. At C display, observe RD FLAGS indicator.
- a) If lit, perform Step 46.
 - b) If extinguished, replace card C19.

- Step 46. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 a) If register equals 00100, perform Step 47.
 b) If register equals any other value, probe Item 29 in Table 3-6, page 3-42.
- Step 47. Position rotary switch C at 2 and observe DØ REGISTER indicators.
 a) If register equals 0114, perform Step 48.
 b) If register equals any other value, probe Item 36 in Table 3-6, page 3-42.
- Step 48. Position rotary switch B at 2 and observe BØ REGISTER indicators.
 a) If register equals 0000, perform Step 49.
 b) If register equals any other value, probe Item 39 in Table 3-6, page 3-42.
- Step 49. Position rotary switch C at 4 and observe the following indicators.
 a) RD BCW INDEX indicator.
 1) If extinguished, press RUN switch and refer to b).
 2) If lit, probe Item 48 in Table 3-6, page 3-43.
 b) RD ADR indicator.
 1) If lit, perform Step 50.
 2) If extinguished, replace cards B17 and C19.
- Step 50. At D display, observe FIRST PASS indicator.
 a) If lit, perform Step 51.
 b) If extinguished, replace cards C08 and C22.
- Step 51. Position rotary switch D at 2 and observe AØ REGISTER indicators.
 a) If register equals 0114, perform Step 52.
 b) If register equals any other value, replace cards C08, B45 and B24.
- Step 52. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 a) If register equals 0116, perform Step 53.
 b) If register equals any other value, replace cards C07, C08, and B51.
- Step 53. Position rotary switch D at 4 and observe 65K CARRY BCW1 indicator.
 a) If extinguished, perform Step 54.
 b) If lit, replace cards C15 and C43.
- Step 54. Position rotary switch D at 3 and observe I/O FLAG REGISTER (A1) indicators.
 a) If all indicators are extinguished, perform Step 55.
 b) If any indicators are lit, probe Item 90 in Table 3-6, page 3-45.
- Step 55. Position rotary switch C at 2 and observe DØ REGISTER indicators.
 a) If register equals 0000, perform Step 56.
 b) If register equals any other value, find the bits that are lit listed below and replace the specified cards.

<u>DØ Bits Lit</u>	<u>Replace Cards</u>
16 and 17	B42 and C08
18 and 19	B41 and C08
20 and 21	B39 and C08
22 and 23	B38 and C08
24 and 25	B37 and C08

DØ Bits LitReplace Cards

26 and 27

B31 and C08

28 and 29

B30 and C08

30 and 31

B29 and C08

- Step 56. Press RUN switch.
- Step 57. Position rotary switch C at 4 and observe RD COUNT indicator.
- a) If extinguished, perform Step 58.
 - b) If lit, perform Step 59.
- Step 58. Position rotary switch D at 3 and observe I/O FLAG REGISTER (A1) TERM indicator.
- a) If extinguished, replace card B17.
 - b) If lit, probe Item 50 in Table 3-6, page 3-43.
- Step 59. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
- a) If register equals 00114, perform Step 60.
 - b) If register equals any other value, replace card C08.
- Step 60. Position rotary switch D at 4 and observe FIRST PASS indicator.
- a) If extinguished, perform Step 61.
 - b) If lit, replace cards C08 and C22.
- Step 61. At C display, observe RD ADR indicator.
- a) If extinguished, perform Step 62.
 - b) If lit, replace cards B17 and C19.
- Step 62. At D display, observe the following indicators.
- a) BIT 15 BCW1 indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card C15.
 - b) MULTIPLEXER OUTPUT INTERFACE DESIGNATORS REJECT indicator.
 - 1) If extinguished, perform Step 63.
 - 2) If lit, replace cards B17 and C12.
- Step 63. Position rotary switch C at 2 and observe DØ REGISTER indicators.
- a) If register equals address of current byte of information being processed, press RUN switch and perform Step 64.
 - b) If register equals any other value, replace card C08. If this does not correct the malfunction, perform SØ Adder Manual Test in paragraph 4-2d, page 4-40.

NOTE

DØ should equal one less than number of passes made through this procedure. For example, on first pass, DØ should equal 0000, on second pass DØ should equal 0001, etc.

- Step 64. Position rotary switch C at 4 and observe the following indicators.
- a) WR COUNT indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace card C19.
 - b) RD COUNT indicator.
 - 1) If extinguished, perform Step 65.
 - 2) If lit, replace cards C19 and B17.

- Step 65. At D display, observe BCW OP CODE indicators.
 a) If both indicators are extinguished, perform Step 66.
 b) If either indicator is lit, replace cards C15 and C22.
- Step 66. Ensure rotary switch B is at 2 and observe BØ REGISTER indicators.
 a) If register equals FFF0, perform Step 67.
 b) If register equals any other value, probe Item 52 in Table 3-6, page 3-43.
- Step 67. Position rotary switch D at 3 and observe STOR WR CTRL indicators.
 a) If both indicators are lit, perform Step 68.
 b) If either indicator is extinguished, replace card B16.
- Step 68. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 a) If register equals 00114, perform Step 69.
 b) If register equals any other value, replace cards C07 and C08.
- Step 69. Position rotary switch D at 4 and observe 65K CARRY DATA ADR indicator.
 a) If extinguished, perform Step 70.
 b) If lit, probe Item 89 in Table 3-6, page 3-45.
- Step 70. Position rotary switch D at 2 and observe AØ REGISTER indicators.
 a) If register equals address of current byte of information being processed, perform Step 71.
 b) If register equals any other value, replace cards C08 and B45.

NOTE

AØ should equal one less than number of passes made through this procedure. For example, on first pass AØ should equal 0000, on second pass AØ should equal 0001, etc.

- Step 71. Position rotary switch C at 2 and observe DØ REGISTER indicators.
 a) If register equals byte count, perform Step 72.
 b) If register equals any other value, replace cards C08 and A43.

NOTE

On first pass through this procedure byte count is 0000; on second pass, byte count is FFF0; on third pass, byte count is FFE0.

- Step 72. Press RUN switch.
- Step 73. Position rotary switch C at 4 and observe the following indicators.
 a) WR ADR indicator.
 1) If lit, refer to b).
 2) If extinguished, replace cards C15 and B17.
 b) WR COUNT indicator.
 1) If extinguished, perform Step 74.
 2) If lit, replace cards C19 and B17.
- Step 74. At B display, observe BØ REGISTER indicators.
 a) If register equals 0001, perform Step 75.
 b) If register equals any other value, probe Item 62 in Table 3-6, page 3-44.
- Step 75. Position rotary switch C at 2 and observe DØ REGISTER indicators.
 a) If register equals address of current byte of information being processed (one less than number of passes made through this procedure), perform Step 76.

- b) If register equals any other value, replace cards C08 and B23.
- Step 76. Position rotary switch C at 4 and observe the following indicators.
 - a) UPDATE BCW1 indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace cards C15, C18 and B17.
 - b) WR FLAGS indicator.
 - 1) If extinguished, perform Step 77.
 - 2) If lit, replace cards C15, C18 and B17.
- Step 77. Position rotary switch B at 4 and observe LD I/O REG SEQ indicator.
 - a) If lit, perform Step 78.
 - b) If extinguished, replace cards C10, C08 and C19.
- Step 78. At A display, observe STORAGE ADDRESS REGISTER (S0) indicators.
 - a) If register equals 00116, perform Step 79.
 - b) If register equals any other value, replace card C07.
- Step 79. Position rotary switch D at 3 and observe STOR WR CTRL indicators.
 - a) If both indicators are lit, perform Step 80.
 - b) If either or both indicators are extinguished, replace card B16.
- Step 80. Position rotary switch D at 4 and observe COUNT = 0 indicator.
 - a) If extinguished, perform Step 81.
 - b) If lit, replace cards C15 and C43.
- Step 81. Probe card location C12, pin 09.
 - a) If MAINTENANCE PROBE is extinguished, perform Step 82.
 - b) If MAINTENANCE PROBE is lit, replace cards C12 and C37.
- Step 82. Press RUN switch.
- Step 83. At C display, observe the following indicators.
 - a) DATA TRANS 1 indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace cards C18 and C19.
 - b) WR ADR indicator.
 - 1) If extinguished, perform Step 84.
 - 2) If lit, replace cards C19 and B17.
- Step 84. At B display, observe LD I/O REG SEQ indicator.
 - a) If extinguished, perform Step 85.
 - b) If lit, replace cards C18 and C10.
- Step 85. Position rotary switch A at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (C0) indicators.
 - a) If register equals F7 and PAR indicator is extinguished, perform Step 86.
 - b) If register does not equal F7 or PAR indicator is lit, replace cards C10, B20, C27, C28 and C29.
- Step 86. At B display, observe ACK SEQ indicator.
 - a) If lit, perform Step 87.
 - b) If extinguished, replace card C10.
- Step 87. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (S0) indicators.
 - a) If register equals address of current byte of information being processed (one less than number of passes through this procedure), perform Step 88.

- b) If register equals any other value, probe Item 71 in Table 3-6, page 3-44.
- Step 88. Position rotary switch C at 2 and observe DØ REGISTER indicators.
 - a) If register equals F700, perform Step 89.
 - b) If register equals any other value, probe Item 82 in Table 3-6, page 3-45.
- Step 89. Position rotary switch D at 3.
- Step 90. At D display, observe STOR WR CTRL indicators; at A display, observe STORAGE ADDRESS REGISTER (SØ) bit 31. If SØ bit 31 is lit, D display indicator WR LOW should be lit and WR UP should be extinguished. If SØ bit 31 is extinguished, D display indicator WR UP should be lit and WR LOW should be extinguished.

NOTE

WR LOW and WR UP should never be lit simultaneously during this check.

- a) If STOR WR CTRL indicators are correct, perform Step 91.
 - b) If STOR WR CTRL indicators are incorrect, replace card B16.
- Step 91. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicator 31.
 - a) If extinguished, perform Step 93.
 - b) If lit, perform Step 92.
- Step 92. Probe card location C37, pins 30 and 31.
 - a) If MAINTENANCE PROBE is extinguished for both pins, perform Step 93.
 - b) If MAINTENANCE PROBE is lit for either pin, replace cards C12 and C37.
- Step 93. Press RUN switch.
- Step 94. Position rotary switch D at 4 and observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SRV OUT indicator.
 - a) If lit, perform Step 95.
 - b) If extinguished, replace card C13.
- Step 95. Position rotary switch C at 4 and observe the following indicators.
 - a) DATA TRANS 2 indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace card C18.
 - b) DATA TRANS 3 indicator.
 - 1) If lit, perform Step 96.
 - 2) If extinguished, replace card C12.
- Step 96. Ensure rotary switch B is at 4 and observe ACK SEQ indicator.
 - a) If extinguished, perform Step 97.
 - b) If lit, replace cards C18 and C10.
- Step 97. At C display, observe DATA TRANS 1 indicator.
 - a) If extinguished, perform Step 98.
 - b) If lit, replace card C18.
- Step 98. Observe LOAD NO DATA indicator.
 - a) If extinguished, perform Step 99.
 - b) If lit, replace card C46.
- Step 99. Press RUN switch.

- Step 100. At C display, observe the following indicators.
- a) DATA TRANS 2 indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card C18.
 - b) DATA TRANS 3 indicator.
 - 1) If extinguished, perform Step 101.
 - 2) If lit, replace cards C18 and C22.
- Step 101. At B display, observe the following indicators.
- a) REQUEST DATA indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, probe Item 87 in Table 3-6, page 3-45.
 - b) ARITH LOCKOUT indicator.
 - 1) If extinguished, perform Step 102.
 - 2) If lit, replace cards B17 and C17.
- Step 102. Press RUN switch twice.
- Step 103. At C display, observe the following MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS indicators.
- a) OPL IN indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card C13.
 - b) SRV IN indicator.
 - 1) If extinguished, perform Step 104.
 - 2) If lit, replace card C13.
- Step 104. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SRV OUT indicator.
- a) If extinguished, perform Step 105.
 - b) If lit, replace card C13.
- Step 105. At B display, observe CHAN ACT indicator.
- a) If extinguished, perform Step 106.
 - b) If lit, replace cards B17 and C14.
- Step 106. Has this procedure been performed three times?
- a) If yes, perform Status Transfer Test in paragraph 3-2g, page 3-46.
 - b) If no, press RUN switch 13 times and return to Step 38e).
- Step 107. Ensure rotary switch D is at 3 and observe I/O FLAG REGISTER (A1) indicators.
- a) If TERM is lit, replace cards B37, B20 and C08.
 - b) If PAR ERR is lit, replace cards B37, B20 and C08.
 - c) If PAR is lit, replace cards B31, B20 and C08.
 - d) If OD PAR is lit, replace cards B31, B20 and C08.
 - e) If CB CK is lit, replace cards B30, B20 and C08.
 - f) If DECR ADR is lit, replace cards B30, B20 and C08.
 - g) If WRITE is lit, replace cards B29, B20 and C08.

Table 3-6. Data Transfer Test Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	305	C17	05	If extinguished probe Item 3 If lit probe Item 2
2	305	C17	50	If extinguished probe Item 4 If lit replace card C14
3	305	C17	12	If extinguished probe Item 5 If lit replace cards C17 and C25
4	305	C17	19	If extinguished replace card C14 If lit replace cards C17 and C25
5	310	C11	04	If lit probe Item 6 If extinguished replace cards B16 and C10
6	310	C11	15	If extinguished perform Step 16 of para 3-2f, page 3-32 If lit replace card C11
7	307	C14	35	If extinguished replace card C13 If lit probe Item 8
8	307	C14	49	If extinguished probe Item 9 If lit replace cards C14 and C22
9	314	B17	53	If extinguished replace card C13 If lit replace card B17
10	315	B16	30	If extinguished probe Item 11 If lit replace cards B16 and C22
11	315	B16	37	If extinguished replace cards B16 and C22 If lit replace card C10
12	305	C17	12	If extinguished replace cards C17 and C25 If lit replace card C11
13	307	C14	14	If extinguished probe Item 14 If lit replace card C13
14	307	C14	18	If extinguished probe Item 15 If lit replace card C10
15	307	C14	20	If extinguished replace card C14 If lit replace card C17
16	310	C11	30	If extinguished probe Item 17 If lit probe Item 13 in Table 3-5, page 3-27
17	310	C11	44	If extinguished replace card C11 If lit probe Item 18
18	310	C11	02	If extinguished replace card C11 If lit probe Item 19
19	310	C11	29	If extinguished replace card C11 If lit probe Item 20
20	310	C11	39	If extinguished probe Item 21 If lit replace card C11

Table 3-6. Data Transfer Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
21	310	C11	24	If extinguished probe Item 22 If lit replace card C11
22	310	C11	25	If extinguished probe Item 23 If lit replace card C11
23	310	C11	43	If extinguished probe Item 24 If lit replace card C11
24	310	C11	37	If extinguished probe Item 25 If lit replace card C11
25	313	C07	47	If extinguished probe Item 26 If lit replace card C07
26	313	C07	44	If extinguished replace cards C07 and C08 If lit probe Item 27
27	313	C07	45	If extinguished replace cards C07 and C08 If lit probe Item 28
28	313	C07	43	If extinguished replace cards C08, B48 and A16 If lit replace card C07
29	313	C07	43	If extinguished probe Item 32 If lit probe Item 30
30	313	C07	45	If extinguished replace cards C07, C08 and C11 If lit probe Item 35
31	313	C07	44	If extinguished replace card C07 If lit replace cards C07, C08 and C11
32	313	C07	17	If extinguished replace card B16 If lit probe Item 33
33	313	C07	48	If extinguished probe Item 34 If lit replace cards A33 and A39
34	313	C07	49	If extinguished replace cards C07, C08 and C11 If lit replace card A36
35	313	C07	51	If extinguished replace card C08 If lit replace card C07
36	312	C08	43	If extinguished probe Item 37 If lit replace card C08
37	403	A43	47	If extinguished replace card A43 If lit probe Item 38
38	403	A43	45	If extinguished replace card A43 If lit replace card C46
39	313	C07	53	If extinguished replace card C07 If lit probe Item 40

Table 3-6. Data Transfer Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
40	313	C07	54	If extinguished replace card C07 If lit probe Item 41
41	313	C07	26	If extinguished probe Item 42 If lit replace card C07
42	313	C07	27	If extinguished probe Item 43 If lit replace card C07
43	313	C07	30	If extinguished probe Item 44 If lit replace card C07
44	313	C07	12	If extinguished probe Item 45 If lit replace card C07
45	313	C07	09	If extinguished probe Item 46 If lit replace card C07
46	313	C07	31	If extinguished probe Item 47 If lit replace card C07
47	313	C07	11	If extinguished replace card B22 If lit replace card C07
48	303	C19	26	If extinguished probe Item 49 If lit replace card C19
49	314	B17	32	If extinguished replace card C11 If lit replace card B17
50	314	B17	26	If extinguished replace card B17 If lit probe Item 51
51	315	B16	15	If extinguished replace card B16 If lit replace cards B37, B31, B30 and B29
52	313	C07	12	If extinguished replace card C07 If lit probe Item 53
53	313	C07	54	If extinguished replace card C07 If lit probe Item 54
54	313	C07	26	If extinguished replace card C07 If lit probe Item 55
55	313	C07	11	If extinguished probe Item 56 If lit replace card C07
56	313	C07	31	If extinguished probe Item 57 If lit replace card C07
57	313	C07	09	If extinguished probe Item 58 If lit replace card C07
58	313	C07	30	If extinguished probe Item 59 If lit replace card C07
59	313	C07	27	If extinguished probe Item 60 If lit replace card C07

Table 3-6. Data Transfer Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
60	313	C07	53	If extinguished replace cards B22, B46, B28, B27 and B26 If lit replace card C07
61	314	B17	30	If extinguished replace card C15 If lit replace cards C15 and B17
62	313	C07	11	If extinguished replace card C07 If lit probe Item 63
63	313	C07	53	If extinguished replace card C07 If lit probe Item 64
64	313	C07	54	If extinguished replace card C07 If lit probe Item 65
65	313	C07	26	If extinguished probe Item 66 If lit replace card C07
66	313	C07	27	If extinguished probe Item 67 If lit replace card C07
67	313	C07	30	If extinguished probe Item 68 If lit replace card C07
68	313	C07	12	If extinguished probe Item 69 If lit replace card C07
69	313	C07	09	If extinguished probe Item 70 If lit replace card C07
70	313	C07	31	If extinguished replace cards B22, B26, B27, B28 and B46 If lit replace card C07
71	312	C08	09	If extinguished replace card C08 If lit probe Item 72
72	312	C08	14	If extinguished replace card C08 If lit probe Item 73
73	312	C08	31	If extinguished replace card C08 If lit probe Item 74
74	313	C07	43	If extinguished probe Item 78 If lit probe Item 75
75	313	C07	44	If extinguished probe Item 78 If lit probe Item 76
76	313	C07	47	If extinguished probe Item 78 If lit probe Item 77
77	313	C07	45	If extinguished probe Item 78 If lit replace card C08
78	313	C07	48	If extinguished probe Item 79 If lit replace card A33
79	313	C07	49	If extinguished probe Item 80 If lit replace card A36

Table 3-6. Data Transfer Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
80	313	C07	17	If extinguished probe Item 81 If lit replace card C07
81	315	B16	05	If extinguished replace card C15 If lit replace cards B16 and B51
82	312	C08	11	If extinguished replace card C08 If lit probe Item 83
83	312	C08	32	If extinguished replace card C08 If lit probe Item 84
84	312	C08	08	If extinguished probe Item 85 If lit replace card C08
85	312	C08	42	If extinguished probe Item 86 If lit replace card C08
86	312	C08	43	If extinguished replace card C08 If lit replace cards B23 and B20
87	314	B17	19	If extinguished probe Item 88 If lit replace cards B16 and B37
88	314	B17	41	If extinguished replace card C15 If lit replace cards B17 and C14
89	309	C12	11	If extinguished replace card C15 If lit replace cards C12, C15 and C43
90	314	B17	26	If extinguished replace card B17 If lit probe Item 91
91	315	B16	15	If extinguished replace card B16 If lit perform Step 107 of para 3-2f, page 3-40
92	314	B17	12	If extinguished replace card C14 If lit probe Item 93
93	314	B17	51	If extinguished probe Item 94 If lit replace cards B17 and C11
94	314	B17	52	If extinguished probe Item 95 If lit replace card C13
95	314	B17	53	If extinguished replace card B17 If lit replace card C13
96	314	B17	24	If extinguished replace cards C14 and C23 If lit replace card B17
97	305	C17	30	If extinguished replace card B17 If lit replace cards C17 and C11
98	154	C47	48	If lit replace card C10 If extinguished probe Item 99
99	154	C47	41	If lit replace card E43 If extinguished probe Item 100

Table 3-6. Data Transfer Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
100	154	C47	39	If lit replace card D16 If extinguished probe Item 101
101	154	C47	38	If lit replace card C13 If extinguished replace card C47

g. Status Transfer Test. - This procedure checks the handshaking of the Multiplexer Channel by instruction-stepping through handshaking between the console and the 9400 processor.

- Step 1. Press CLOCK RATE CLEAR switch.
- Step 2. Press CLOCK RATE INST indicator-switch.
- Step 3. Press EOM (end of message) key on console.
- Step 4. Observe LOAD SUBSYSTEM CHECK indicator.
 - a) If lit, perform Step 5.
 - b) If extinguished, perform Step 8.
- Step 5. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 0003B, perform Step 6.
 - b) If register equals any other value, perform Step 7.
- Step 6. Position rotary switch C at 2 and observe DØ REGISTER indicators.
 - a) If register equals 8000, perform Interrupt Sequence Test in paragraph 3-2h, page 3-50.
 - b) If register equals any other value, perform Step 7.
- Step 7. Press SYSTEM RESET switch.
- Step 8. Press LOAD switch.
- Step 9. Press CLOCK RATE CYCLE indicator-switch.
- Step 10. Press CYCLE COUNT indicator-switch.
- Step 11. Position rotary switch A at 2.
- Step 12. Press A display CLEAR switch, then set CLOCK CYCLE COUNTER (MØ) to 18.
- Step 13. Press EOM (end of message) key on console.
- Step 14. Press LOAD switch.
- Step 15. Press RUN switch.
- Step 16. Observe LOGIC STOP indicators.
 - a) If all four indicators are extinguished, perform Step 17.
 - b) If I/O PARITY CHECK indicator is lit, replace cards C47, D16, E43 and C10.
 - c) If STORAGE PARITY CHECK indicator is lit, perform Parity Generator/Checker Malfunction Isolation Procedure in paragraph 4-3b(9), page 4-141.
 - d) If INTERFACE CHECK indicator is lit, perform Operator/Maintenance Panel Manual Test in paragraph 4-2a(1), page 4-1.
 - e) If ADDRESS COMPARE indicator is lit, replace cards C47 and C53.

- Step 17. At A display, observe CLOCK CYCLE COUNTER (MØ) indicators.
- If register equals 00, perform Step 18.
 - If register equals any other value, perform Cycle Counter Manual Test in paragraph 4-2e, page 4-46.
- Step 18. Press CYCLE COUNT CLEAR.
- Step 19. Position rotary switches A, B, C and D at 4.
- Step 20. Press RUN switch nine times.
- Step 21. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS CMD OUT indicator.
- If extinguished, press RUN switch twice and perform Step 22.
 - If lit, replace cards C13 and C22.
- Step 22. At C display, observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS STA IN indicator.
- If lit, perform Step 23.
 - If extinguished, replace card C13.
- Step 23. At B display, observe the indicators specified in a) through j) below.
- REQUEST STATUS indicator.
 - If lit, refer to b).
 - If extinguished, replace card C14.
 - REQUEST ARITH indicator.
 - If lit, refer to c).
 - If extinguished, replace card C14.
 - ARITH FREE indicator.
 - If lit, press RUN switch and refer to d).
 - If extinguished, replace card C21.
 - REQUEST ARITH indicator.
 - If extinguished, refer to e).
 - If lit, probe Item 1 in Table 3-7, page 3-49.
 - LD I/O REG SEQ indicator.
 - If lit, refer to f).
 - If extinguished, probe Item 3 in Table 3-7, page 3-49.
 - ARITH LOCKOUT indicator.
 - If lit, refer to g).
 - If extinguished, replace cards B17, C17 and C11.
 - CHAN ACT indicator.
 - If lit, press RUN switch and refer to h).
 - If extinguished, replace cards B17 and C13.
 - LD I/O REG SEQ indicator.
 - If extinguished, refer to i).
 - If lit, probe Item 7 in Table 3-7, page 3-49.
 - ACK SEQ indicator.
 - If lit, refer to j).
 - If extinguished, replace cards C10 and C18.
 - STA TRANS indicator.
 - If lit, perform Step 24.
 - If extinguished, replace cards C10 and C20.
- Step 24. Ensure rotary switch A is at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
- If PAR is lit and register equals 0C, perform Step 25.
 - If PAR is extinguished or register does not equal 0C, probe Item 9 in Table 3-7, page 3-49.

- Step 25. Position rotary switch C at 2 and observe DØ REGISTER indicators.
a) If register equals 0C00, perform Step 26.
b) If register equals any other value, probe Item 11 in Table 3-7, page 3-49.
- Step 26. Position rotary switch B at 2 and observe BØ REGISTER indicators.
a) If register equals 0000, perform Step 27.
b) If register equals any other value, probe Item 13 in Table 3-7, page 3-49.
- Step 27. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (SØ) indicators.
a) If register equals 00100, perform Step 28.
b) If register equals any other value, probe Item 15 in Table 3-7, page 3-49.
- Step 28. Position rotary switch D at 3 and observe STR WR CTRL indicators.
a) If WR UP indicator is lit and WR LOW indicator is extinguished, press RUN switch and perform Step 29.
b) If any other condition exists, replace card B16.
- Step 29. Position rotary switch B at 4 and observe the following indicators.
a) ACK SEQ indicator.
1) If extinguished, refer to b).
2) If lit, replace cards C10 and C18.
b) STA TRANS indicator.
1) If extinguished, refer to c).
2) If lit, replace cards C10 and C20.
c) WR DEV NUM SEQ indicator.
1) If lit, perform Step 30.
2) If extinguished, replace card C20.
- Step 30. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
a) If register equals 0003B, perform Step 31.
b) If register equals any other value, replace cards C07 and C11.
- Step 31. Position rotary switch D at 4 and observe MULTIPLEXER OUTPUT INTER-FACE DESIGNATORS SRV OUT indicator.
a) If lit, perform Step 32.
b) If extinguished, replace card C13.
- Step 32. Position rotary switch A at 4 and observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
a) If register equals 80, perform Step 33.
b) If register equals any other value, replace cards C10, B46, C28 and C29.
- Step 33. At C display, observe DØ REGISTER indicators.
a) If register equals 8000, perform Step 34.
b) If register equals any other value, replace card C08.
- Step 34. Position rotary switch D at 3 and observe STR WR CTRL indicators.
a) If WR UP and WR LOW indicators are both lit, perform Step 35.
b) If either indicator is extinguished, replace card B16.
- Step 35. Observe RUN indicator.
a) If lit, perform Step 36.
b) If extinguished, replace cards C27 and C21.
- Step 36. Observe LOAD CHECK indicator.

- a) If extinguished, press RUN switch and perform Step 37.
- b) If lit, replace card C21.

Step 37. Observe LOAD SUBSYSTEM CHECK indicator.

- a) If lit, perform Interrupt Sequence Test in paragraph 3-2h, page 3-50.
- b) If extinguished, replace cards A16 and B17.

Table 3-7. Status Transfer Test Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	307	C14	20	If extinguished probe Item 2 If lit replace card C14
2	305	C17	14	If extinguished replace card C17 If lit replace card C11
3	311	C10	52	If extinguished probe Item 6 If lit probe Item 4
4	309	C12	12	If extinguished replace card C12 If lit probe Item 5
5	311	C10	49	If extinguished replace card C10 If lit replace card C18
6	311	C10	18	If extinguished replace cards B20 and C29 If lit replace card C10
7	311	C10	42	If extinguished replace card C11 If lit probe Item 8
8	311	C10	49	If extinguished replace card C18 If lit replace card C10
9	311	C10	48	If extinguished replace card C10 If lit probe Item 10
10	311	C10	02	If extinguished replace card C14 If lit replace cards B20 and C10
11	312	C08	32	If extinguished replace card C08 If lit probe Item 12
12	312	C08	11	If extinguished replace card C08 If lit replace cards B20 and B23
13	313	C07	53	If extinguished replace cards C07 and B16 If lit probe Item 14
14	313	C07	54	If extinguished replace cards C07 and B16 If lit replace card B22
15	313	C07	45	If extinguished probe Item 16 If lit probe Item 19
16	313	C07	47	If extinguished probe Item 17 If lit probe Item 19
17	313	C07	44	If extinguished replace card C13 If lit probe Item 18

Table 3-7. Status Transfer Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
18	313	C07	43	If extinguished replace card C07 If lit probe Item 20
19	313	C07	41	If extinguished replace card B16 If lit replace card C07
20	310	C11	02	If extinguished replace cards C11 and B48 If lit probe Item 21
21	310	C11	39	If extinguished replace cards C11 and B48 If lit replace cards C08 and C11

h. Interrupt Sequence Test. - This procedure checks the interrupt sequences by cycling through and observing the interrupt sequences after transferring an end of message from the console to the 9400 processor.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Press MAINTENANCE WRITE switch to active position.
- Step 3. Position rotary switch D at 1 and set PSW INSTRUCTION ADDRESS (P0) to 000B8.
- Step 4. Position rotary switch C at 2 and set D0 REGISTER to FFF0.
- Step 5. Press RUN switch three times.
- Step 6. Press C display CLEAR switch, then set D0 REGISTER to 0400.
- Step 7. Press RUN switch.
- Step 8. Press D display CLEAR switch, then set PSW INSTRUCTION ADDRESS (P0) to 00400.
- Step 9. Press C display CLEAR switch, then set D0 REGISTER to 9900.
- Step 10. Press RUN switch.
- Step 11. Press C display CLEAR switch, then set D0 REGISTER to OFFF.
- Step 12. Press RUN switch.
- Step 13. Return MAINTENANCE WRITE switch to inactive position.
- Step 14. Press SYSTEM RESET switch.
- Step 15. Set LOAD ADDRESS CHANNEL NUMBER to 0.
- Step 16. Set LOAD ADDRESS CONTROL UNIT NUMBER to 8.
- Step 17. Set LOAD ADDRESS DEVICE NUMBER to 0.
- Step 18. Press LOAD switch.
- Step 19. Observe READ indicator on console.
 - a) If lit, perform Step 20.
 - b) If extinguished, perform Load Selection Sequence Test in paragraph 3-2d, page 3-19.
- Step 20. Observe LOAD WAIT indicator.
 - a) If extinguished, perform Step 21.
 - b) If lit, perform Load Selection Sequence Test in paragraph 3-2d, page 3-19.

- Step 21. Position rotary switch C at 1 and observe COND CODE (PØ) indicators 34 and 35.
- a) If both indicators are extinguished, perform Step 22.
 - b) If either indicator is lit, perform Load Selection Sequence Test in paragraph 3-2d, page 3-19.
- Step 22. Press CLOCK RATE CLEAR switch.
- Step 23. Press CLOCK RATE INST indicator-switch.
- Step 24. Press EOM (end of message) key on console.
- Step 25. Observe LOGIC STOP indicators.
- a) If all indicators are extinguished, perform Step 26.
 - b) If I/O PARITY CHECK indicator is lit, replace cards C10, C47, D16 and E43.
 - c) If STORAGE PARITY CHECK indicator is lit, perform memory manual tests in paragraph 4-3b, page 4-119.
 - d) If ADDRESS COMPARE indicator is lit, replace cards C47 and C53.
- Step 26. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (SØ) indicators.
- a) If register equals 0003B, perform Step 27.
 - b) If register equals any other value, perform Status Transfer Test in paragraph 3-2g, page 3-46.
- Step 27. Observe LOAD CHECK indicator.
- a) If lit, perform Step 28.
 - b) If extinguished, perform Status Transfer Test in paragraph 3-2g, page 3-46.
- Step 28. Press RUN switch.
- Step 29. Observe LOAD SUBSYSTEM CHECK indicator.
- a) If extinguished, perform Step 30.
 - b) If lit, perform Step 34.
- Step 30. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
- a) If register equals 000B8, perform Step 31.
 - b) If register equals any other value, perform Step 32.
- Step 31. Ensure rotary switch D is at 1 and observe PSW INSTRUCTION ADDRESS (PØ) indicators.
- a) If register equals 00400, perform Step 32.
 - b) If register equals any other value, perform Step 34.
- Step 32. Ensure rotary switch C is at 2 and observe DØ REGISTER indicators.
- a) If register equals FFF0, replace cards C05 and C06.
 - b) If register equals any other value, perform Step 34.
- Step 33. Press SYSTEM RESET switch.
- Step 34. Press LOAD switch.
- Step 35. Press CLOCK RATE CLEAR switch.
- Step 36. Press CLOCK RATE INST indicator-switch.
- Step 37. Press EOM (end of message) key on console.
- Step 38. Press CLOCK RATE CYCLE indicator-switch.
- Step 39. Press RUN switch twice.

- Step 40. Position rotary switch D at 3 and observe INTERRUPT SEQUENCE 0 indicator.
- If lit, perform Step 41.
 - If extinguished, probe Item 1 in Table 3-8, page 3-55.
- Step 41. Position rotary switch C at 3 and observe ARITHMETIC CONTROL SEQUENCER WR UP indicator.
- If lit, perform Step 42.
 - If extinguished, replace cards A23 and A31.
- Step 42. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
- If register equals 0003E, perform Step 43.
 - If register equals any other value, probe Item 7 in Table 3-8, page 3-55.
- Step 43. Position rotary switch B at 4 and observe STACK indicator.
- If lit, perform Step 44.
 - If extinguished, replace card C14.
- Step 44. At D display, observe STOR WR CTRL indicators.
- If both indicators are lit, perform Step 45.
 - If either indicator is extinguished, probe Item 13 in Table 3-8, page 3-56.
- Step 45. Position rotary switch C at 2 and observe DØ REGISTER indicators.
- If register equals 0000, perform Step 46.
 - If register equals any other value, probe Item 14 in Table 3-8, page 3-56.
- Step 46. Position rotary switch C at 3 and observe ARITHMETIC CONTROL SEQUENCER INST 1 indicator.
- If extinguished, perform Step 47.
 - If lit, replace card A26.
- Step 47. Press RUN switch.
- Step 48. At D display, observe INTERRUPT SEQUENCE 1 indicator.
- If lit, perform Step 49.
 - If extinguished, replace card A26.
- Step 49. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
- If register equals 0003C, perform Step 50.
 - If register equals any other value, probe Item 15 in Table 3-8, page 3-56.
- Step 50. At D display, observe indicators specified in a) through d) below.
- STOR WR CTRL indicators.
 - If both indicators are lit, refer to b).
 - If either indicator is extinguished, probe Item 19 in Table 3-8, page 3-56.
 - INTERRUPT SEQUENCE 0 indicator.
 - If extinguished, press RUN switch and refer to c).
 - If lit, replace card A26.
 - INTERRUPT SEQUENCE 2 indicator.
 - If lit, refer to d).
 - If extinguished, replace card A26.
 - INTERRUPT SEQUENCE 1 indicator.
 - If extinguished, perform Step 51.
 - If lit, replace card A26.

- Step 51. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
a) If register equals 0003A, perform Step 52.
b) If register equals any other value, probe Item 20 in Table 3-8, page 3-56.
- Step 52. Position rotary switch C at 1 and observe COND CODE (PØ) indicators 34 and 35.
a) If both indicators are lit, perform Step 53.
b) If either indicator is extinguished, replace card B19.
- Step 53. Press RUN switch.
- Step 54. At D display, observe the following indicators.
a) INTERRUPT SEQUENCE 3 indicator.
1) If lit, refer to b).
2) If extinguished, replace card A26.
b) INTERRUPT SEQUENCE 2 indicator.
1) If extinguished, perform Step 55.
2) If lit, replace card A26.
- Step 55. Position rotary switch D at 1 and observe PSW INSTRUCTION ADDRESS (PØ) indicators.
a) If register equals 03800, perform Step 56.
b) If register equals any other value, probe Item 25 in Table 3-8, page 3-56.
- Step 56. Observe LOAD SUBSYSTEM CHECK indicator.
a) If lit, perform Step 57.
b) If extinguished, replace card A16.
- Step 57. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
a) If register equals 00038, perform Step 58.
b) If register equals any other value, replace cards A16 and A26.
- Step 58. Position rotary switch C at 2 and observe DØ REGISTER indicators.
a) If register equals 3800, perform Step 59.
b) If register equals any other value, probe Item 27 in Table 3-8, page 3-56.
- Step 59. Position rotary switch D at 3 and observe the following indicators.
a) STOR WR CTRL indicators.
1) If both indicators are lit, press RUN switch and refer to b).
2) If either indicator is extinguished, probe Item 29 in Table 3-8, page 3-57.
b) INTERRUPT SEQUENCE 0 indicator.
1) If lit, refer to c).
2) If extinguished, replace card A26.
c) INTERRUPT SEQUENCE 3 indicator.
1) If extinguished, perform Step 60.
2) If lit, replace card A26.
- Step 60. Position rotary switch C at 3 and observe PASS 3 indicator.
a) If lit, perform Step 61.
b) If extinguished, replace card A22.
- Step 61. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators*.
a) If register equals 000BE, perform Step 62.
b) If register equals any other value, probe Item 30 in Table 3-8, page 3-57.

- Step 62. Press RUN switch.
- Step 63. At D display, observe the following indicators.
- a) INTERRUPT SEQUENCE 1 indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace card A26.
 - b) INTERRUPT SEQUENCE 0 indicator.
 - 1) If lit, perform Step 64.
 - 2) If extinguished, replace card A26.
- Step 64. Position rotary switch C at 2 and observe DØ REGISTER indicators.
- a) If register equals 0400, perform Step 65.
 - b) If register equals any other value, probe Item 32 in Table 3-8, page 3-57.
- Step 65. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
- a) If register equals 000BC, perform Step 66.
 - b) If register equals any other value, probe Item 15 in Table 3-8, page 3-56.
- Step 66. Press RUN switch.
- Step 67. At D display, observe the following indicators.
- a) INTERRUPT SEQUENCE 2 indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace card A26.
 - b) INTERRUPT SEQUENCE 1 indicator.
 - 1) If extinguished, perform Step 68.
 - 2) If lit, replace card A26.
- Step 68. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
- a) If register equals 000BA, perform Step 69.
 - b) If register equals any other value, probe Item 20 in Table 3-8, page 3-56.
- Step 69. At C display, observe DØ REGISTER indicators.
- a) If register equals FFFF, perform Step 70.
 - b) If register equals any other value, probe Item 32 in Table 3-8, page 3-57.
- Step 70. Position rotary switch D at 1 and observe PSW INSTRUCTION ADDRESS (PØ) indicators.
- a) If register equals 10400, perform Step 71.
 - b) If register equals any other value, probe Item 33 in Table 3-8, page 3-57.
- Step 71. Press RUN switch.
- Step 72. Position rotary switch D at 3 and observe INTERRUPT SEQUENCE 3 indicator.
- a) If lit, perform Step 73.
 - b) If extinguished, replace card A26.
- Step 73. Observe LOAD SUBSYSTEM CHECK indicator.
- a) If extinguished, perform Step 74.
 - b) If lit, probe Item 35 in Table 3-8, page 3-57.
- Step 74. At D display, observe INTERRUPT SEQUENCE 2 indicator.
- a) If extinguished, perform Step 75.
 - b) If lit, replace card A26.

- Step 75. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 a) If register equals 000B8, perform Step 76.
 b) If register equals any other value, replace cards A33 and A26.
- Step 76. Press RUN switch.
- Step 77. Position rotary switch C at 3 and observe the following ARITHMETIC CONTROL SEQUENCER indicators.
 a) RD P indicator.
 1) If lit, press RUN switch and refer to b).
 2) If extinguished, perform Step 78.
 b) WR UP indicator.
 1) If lit, refer to c).
 2) If extinguished, replace cards A23, A26 and A24.
 c) RD P indicator.
 1) If extinguished, perform Step 79.
 2) If lit, replace cards A22 and A23.
- Step 78. At C display, observe PASS 3 indicator.
 a) If lit, replace card A22.
 b) If extinguished, probe Item 36 in Table 3-8, page 3-57.
- Step 79. Position rotary switch C at 1 and observe all indicators.
 a) If all indicators are extinguished, replace cards A22 and A23.
 b) If one or more indicators are lit, replace cards A29 and B19.

Table 3-8. Interrupt Sequence Test Monitor Probe Table

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	500	A26	24	If extinguished probe Item 2 If lit probe Item 5
2	500	A26	43	If extinguished replace cards A26 and A31 If lit probe Item 3
3	500	A26	49	If extinguished probe Item 4 If lit replace card A23
4	500	A26	52	If extinguished replace cards A26 and A31 If lit replace card A22
5	515	A16	26	If extinguished probe Item 6 If lit replace cards A16 and A31
6	309	C12	37	If extinguished replace card C11 If lit replace card C12
7	515	A16	12	If extinguished probe Item 8 If lit replace card A16
8	515	A16	15	If extinguished probe Item 9 If lit replace card A16
9	515	A16	29	If extinguished probe Item 10 If lit replace card A16
10	515	A16	13	If extinguished probe Item 11 If lit replace card A16

Table 3-8. Interrupt Sequence Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
11	515	A16	18	If extinguished perform SØ Adder Manual Test in para 4-2d, page 4-40 If lit probe Item 12
12	515	A16	27	If extinguished replace card A29 If lit replace card A16
13	503	A23	53	If extinguished replace card A23 If lit replace cards A25 and A31
14	506	A32	44	If extinguished replace card A32 If lit replace card B24
15	500	A26	30	If extinguished probe Item 16 If lit replace card A26
16	505	A33	12	If extinguished replace card A33 If lit probe Item 17
17	313	C07	43	If extinguished probe Item 18 If lit replace card C07
18	313	C07	47	If extinguished perform SØ Adder Manual Test in para 4-2d, page 4-40 If lit replace card C07
19	503	A23	33	If extinguished replace card A23 If lit replace card A25
20	508	A29	27	If extinguished replace card A29 If lit probe Item 21
21	505	A33	08	If extinguished replace card A33 If lit probe Item 22
22	505	A33	12	If extinguished replace card A33 If lit probe Item 23
23	313	C07	45	If extinguished probe Item 24 If lit replace card C07
24	313	C07	47	If lit replace card C07 If extinguished replace card B48*
25	507	A30	02	If extinguished replace card A30 If lit probe Item 26
26	507	A30	14	If extinguished replace card A30 If lit replace cards B5Q and B47
27	506	A32	44	If extinguished probe Item 28 If lit replace card A32
28	500	A26	31	If extinguished replace card B24 If lit replace card A26

* If card replacement does not correct malfunction, perform SØ Adder Manual Test in para 4-2d, page 4-40.

Table 3-8. Interrupt Sequence Test Monitor Probe Table (continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
29	503	A23	53	If extinguished replace card A26 If lit replace card A25
30	515	A16	15	If extinguished replace card A16 If lit probe Item 31
31	515	A16	05	If extinguished replace card A16 If lit replace card B59
32	503	A23	08	If extinguished replace card A23 If lit replace card A43
33	507	A30	30	If extinguished replace card A30 If lit probe Item 34
34	507	A30	14	If extinguished replace card A30 If lit replace card B50
35	515	A16	17	If extinguished replace card A16 If lit replace card B47
36	503	A23	17	If extinguished replace card A22 If lit replace card A23

3-3. SELECTOR CHANNEL LOAD FAILURE ANALYSIS. - The following information is provided to assist in isolating malfunctions which cause a load failure on Selector Channel 1.

The main vehicle used for isolation is the simulated malfunction data in the SLL formatted list in paragraph 5-2, page 5-5. To isolate the malfunction, refer to this paragraph and follow the detailed isolation procedures by first recording the specified maintenance panel displays, and then matching the recorded displays with those in the formatted list.

If a particular site has a system with loading devices on Selector Channel 1 only and isolation is not successful using the above procedure, refer to the System Reset Investigation Procedure in paragraph 3-2a, page 3-1.

SECTION 4

MANUAL TESTS

4-1. GENERAL. - This section contains manual procedures for isolating and correcting malfunctions that occur in logic areas not tested under program control and, therefore, not covered by isolation procedures in the SORT-IT listings in Section 5. The manual tests are divided into two major categories: processor manual tests (in paragraph 4-2) and storage manual tests (in paragraph 4-3). Individual manual tests are referenced from the operating instructions in Section 2.

4-2. PROCESSOR MANUAL TESTS. - The following paragraphs contain step-by-step procedures for manually isolating suspected malfunctions in the processor logic. The procedures are arranged as follows:

- 1) System Reset
- 2) Maintenance Read/Write
- 3) Clear Main Storage
- 4) SØ Adder
- 5) Cycle Counter
- 6) Clock Rate
- 7) Phase Enable

a. System Reset Manual Test. - This test, composed of five subtests, is designed to isolate and correct malfunctions which cause flip-flops indicated on the processor operator and maintenance panels to remain set after a system reset (master clear) operation is performed. The first subtest tests for malfunctions affecting operator panel displays and displays on the lower one-third of the maintenance panel. The remaining four subtests test for malfunctions affecting the A, B, C, and D displays on the upper two-thirds of the maintenance panel. Reference to the appropriate subtest is made from the System Reset Investigation in paragraph 3-2a, page 3-1.

(1) Operator/maintenance panel manual test. - The following procedure is performed to isolate and correct the cause of malfunctions affecting circuits associated with operator panel displays and certain maintenance panel displays.

Step 1. In the following list locate panel indicator that is lit and perform specified operation.

<u>Indicator</u>	<u>Action Required</u>
RUN	Perform Step 2
CYCLE COUNT	Replace cards C49 and C46
CLOCK RATE PHASE	Perform Clock Rate Manual Test in para 4-2f, page 4-47
CLOCK RATE CYCLE	Perform Clock Rate Manual Test in para 4-2f, page 4-47
CLOCK RATE INST	Perform Clock Rate Manual Test in para 4-2f, page 4-47
CLOCK RATE PHASE REPEAT	Replace cards C51 and C46

<u>Indicator</u>	<u>Action Required</u>
CLOCK PHASE 1	Perform Phase Enable Manual Test in para 4-2g, page 4-48
CLOCK PHASE 2	Perform Phase Enable Manual Test in para 4-2g, page 4-48
CLOCK PHASE 3	Perform Phase Enable Manual Test in para 4-2g, page 4-48
CLOCK PHASE 4	Perform Phase Enable Manual Test in para 4-2g, page 4-48
LOAD WAIT	Perform Step 7
LOAD NO DATA	Perform Step 10
LOAD CHECK	Replace card C21
LOAD SUBSYSTEM CHECK	Perform Step 14
LOGIC STOP I/O PARITY CHECK	Perform Step 22
LOGIC STOP STORAGE PARITY CHECK	Perform Step 23
LOGIC STOP INTERFACE CHECK	Probe Item 98 in Table 3-6, page 3-45
LOGIC STOP ADDRESS COMPARE	Replace cards C47 and C53
Step 2. Observe LOAD WAIT indicator.	
a) If extinguished, perform Step 3.	
b) If lit, replace card C46.	
Step 3. Press CLOCK RATE PHASE indicator-switch.	
Step 4. Observe CLOCK PHASE 4 indicator.	
a) If lit, perform Step 5.	
b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.	
Step 5. Press CLOCK PHASE 1 indicator-switch.	
Step 6. Press CLOCK RATE INST indicator-switch while observing CLOCK PHASE 1 indicator.	
a) If lit, perform Phase Enable Manual Test in paragraph 4-2g, page 4-48.	
b) If extinguished, replace cards C23 and C21.	
Step 7. Position rotary switch D at 5 and observe INITIAL LOAD SEQUENCE indicators 1 through 6.	
a) If more than one indicator is lit, perform Step 8.	
b) If only INITIAL LOAD SEQUENCE 6 is lit, replace card C20.	
c) If all indicators are extinguished, replace card C21.	
Step 8. Position rotary switch D at 4 and observe START I/O and ZERO STA indicators.	
a) If either indicator is lit, perform Step 9.	
b) If both indicators are extinguished, replace card C12.	

- Step 9. Position rotary switch A at 2, then press and hold SYSTEM RESET switch while observing CLOCK CYCLE COUNTER (MØ) indicators.
a) If all indicators are extinguished, replace card C48.
b) If one or more indicators are lit, replace card C46.
- Step 10. Press CLOCK RATE PHASE REPEAT indicator-switch.
- Step 11. Press SYSTEM RESET switch and observe CLOCK RATE PHASE REPEAT indicator.
a) If extinguished, perform Step 12.
b) If lit, replace card C46.
- Step 12. Position rotary switch D at 5 and observe INITIAL LOAD SEQUENCE indicators 1 through 6.
a) If more than one indicator is lit, perform Step 13.
b) If only INITIAL LOAD SEQUENCE 6 is lit, replace card C20.
c) If all indicators are extinguished, replace card C46.
- Step 13. Position rotary switch D at 4 and observe START I/O and ZERO STA indicators.
a) If either indicator is lit, perform Step 14.
b) If both indicators are extinguished, replace card C12.
- Step 14. Position rotary switch B at 7 and observe INTERRUPT REQ indicator.
a) If lit, perform Step 15.
b) If extinguished, perform Step 16.
- Step 15. Position rotary switch B at 8 and observe INTERRUPT REQ indicator.
a) If lit, replace card C46.
b) If extinguished, perform Step 17.
- Step 16. Position rotary switch B at 8 and observe INTERRUPT REQ indicator.
a) If lit, proceed to Step 19.
b) If extinguished, perform Step 21.
- Step 17. Position rotary switch B at 7 and press INTERRUPT LOCKOUT indicator-switch.
- Step 18. Press SYSTEM RESET switch and again at B7 display observe INTERRUPT LOCKOUT indicator.
a) If lit, replace cards C46, E55 and E43.
b) If extinguished, replace card E43.
- Step 19. At B8 display, press INTERRUPT LOCKOUT indicator-switch.
- Step 20. Press SYSTEM RESET switch and at B8 display observe INTERRUPT LOCKOUT indicator.
a) If lit, replace cards C46, D56 and D16.
b) If extinguished, replace card D16.
- Step 21. Position rotary switch D at 3 and observe INTERRUPT REQ TIMER indicator.
a) If lit, replace cards C48 and C46.
b) If extinguished, replace cards A16, B17 and C12.
- Step 22. Observe LOGIC STOP I/O INTERFACE CHECK indicator.
a) If lit, replace cards C47 and C46.
b) If extinguished, replace cards C47, D16, E43 and C10.
- Step 23. Observe LOGIC STOP I/O PARITY CHECK indicator.
a) If lit, replace cards C46 and C47.

- b) If extinguished, perform Parity Generator/Checker Malfunction Isolation Procedure in paragraph 4-3b(8), page 4-133.

(2) A display manual test. - The following procedure is performed to isolate and correct malfunctions in the circuitry indicated by the A display on the maintenance panel.

- Step 1. Note current position of rotary switch A, then refer to step specified below for that switch position.

<u>Switch Position</u>	<u>Perform Step</u>
1	2
2	14
3	21
4	22
5	28
6	37
7	50
8	52

- Step 2. At A display, perform the following:
- Observe MAINT RD/WR indicator.
 - If extinguished, refer to b).
 - If lit, replace cards C48 and A23.
 - Observe STORAGE ADDRESS REGISTER (SØ) indicators 15 through 21.
 - If all indicators are extinguished, perform Step 13.
 - If more than one indicator is lit, perform Step 3.
 - If a single indicator is lit, replace corresponding card listed below.

<u>SØ Indicator</u>	<u>Replace Card</u>
15	B54
16	B63
17	B63
18	B63
19	B63
20	B63
21	B62

- Step 3. Position rotary switch A at 3 and observe DEC DIV FAULT indicator.
- If lit, replace card C46.
 - If extinguished, observe DEC CARRY indicator.
 - If lit, replace card C46.
 - If extinguished, perform Step 4.
- Step 4. Press CLOCK RATE PHASE indicator-switch.
- Step 5. Press CLOCK PHASE 3 indicator-switch.
- Step 6. Press CLOCK RATE PHASE REPEAT indicator-switch.
- Step 7. Press RUN switch.

- Step 8. Position rotary switch B at 1, then set R1 (F0) bits 08 and 09.
- Step 9. Position rotary switch B at 3, then press RD ADR SEQ 31 indicator-switch.
- Step 10. Position rotary switch C at 2 and observe D0 REGISTER indicators 24 and 25.
 a) If both indicators are extinguished, perform Step 11.
 b) If both indicators are lit, replace cards C48, A33 and B48.
- Step 11. Press SYSTEM RESET switch.
- Step 12. Ensure rotary switch A is at 3 and observe LOWER BOUND (H4) indicators.
 a) If all indicators are lit, perform Phase Enable Manual Test in paragraph 4-2g, page 4-48.
 b) If all indicators are extinguished, replace card C36.
- Step 13. Position rotary switch A at 1 and perform the following observations:
 a) Observe STORAGE ADDRESS REGISTER (S0) indicator 22.
 1) If extinguished, refer to b).
 2) If lit, replace cards B62 and C11.
 b) Observe STORAGE ADDRESS REGISTER (S0) indicators 23 through 31.
 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 2) If more than one indicator is lit, replace cards C48 and C46.
 3) If a single indicator is lit, replace corresponding card listed below.

<u>S0 Indicator</u>	<u>Replace Card</u>
23	B26
24	B57
25	B57
26	B56
27	B56
28	B59
29	B59
30	B58
31	B58

- Step 14. At A display, perform the following:
 a) Observe SS DESIGNATORS (H2) indicators.
 1) If more than one indicator is lit, refer to b).
 2) If all indicators are extinguished, refer to c).
 3) If a single indicator is lit, replace corresponding card listed below.

<u>H2 Indicator</u>	<u>Replace Card</u>
00	A47
01	A47
02	A49
03	A49

<u>H2 Indicator</u>	<u>Replace Card</u>
04	A50
05	A50
06	A50
07	A50

- b) Press and hold SYSTEM RESET switch while observing CLOCK CYCLE COUNTER (MØ) indicators.
 - 1) If all indicators are extinguished, replace cards A39, B35 and C48.
 - 2) If one or more indicators are lit, replace cards C48 and C46.
 - c) Observe CARRY IN 27 indicator.
 - 1) If lit, perform Step 15.
 - 2) If extinguished, perform Step 20.
- Step 15. Ensure rotary switch B is at 3, then observe RD OP1 and COUNT indicators.
 - a) If both indicators are extinguished, perform Step 16.
 - b) If either indicator is lit, replace cards C46 and A54.
- Step 16. Press CLOCK RATE PHASE indicator-switch.
- Step 17. Press RUN switch three times. (CLOCK PHASE 3 indicator will light.)
- Step 18. At B display, press WR ADR SEQ 28 indicator-switch.
- Step 19. Press RUN switch three times, and at B display observe WR ADR SEQ 29 indicator.
 - a) If lit, replace card A39.
 - b) If extinguished, replace card B36.
- Step 20. Position rotary switch A at 2, then press and hold SYSTEM RESET switch while observing that all CLOCK CYCLE COUNTER (MØ) indicators are extinguished.
 - a) If a single indicator is lit, replace card C49.
 - b) If more than one indicator is lit, replace cards C46 and C48.
- Step 21. At A display, perform the following:
 - a) Observe DEC DIV FAULT and DEC CARRY indicators.
 - 1) If both indicators are extinguished, refer to b).
 - 2) If both indicators are lit, replace cards C46 and C48.
 - 3) If only DEC DIV FAULT indicator is lit, replace card A56.
 - 4) If only DEC CARRY is lit, replace card A56.
 - b) Observe UPPER BOUND (H4) indicators.
 - 1) If all indicators are extinguished, refer to c).
 - 2) If a single indicator is lit, replace card B53.
 - 3) If more than one indicator is lit, refer to d).
 - c) Observe LOWER BOUND (H4) indicators.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If a single indicator is lit, replace card B52.
 - 3) If more than one indicator is lit, replace cards B36, B46, B52 and C36.
 - d) Observe LOWER BOUND (H4) indicators.
 - 1) If all indicators are extinguished, replace cards B46, B36 and C36.
 - 2) If a single indicator is lit, replace card C36.

- Step 22. At A display, observe MULTIPLEXER I/O BUFFER REGISTER (CØ) indicators.
- If more than one indicator is lit, perform Step 23.
 - If all indicators are extinguished, perform Step 25.
 - If a single indicator is lit, perform appropriate action specified below.

<u>CØ Indicator</u>	<u>Action Required</u>
PAR	Perform Step 24
00	Replace card C29
01	Replace card C29
02	Replace card C29
03	Replace card C29
04	Replace card C28
05	Replace card C28
06	Replace card C28
07	Replace card C28

- Step 23. Position rotary switch D at 3 and observe I/O FLAG REGISTER (A1) TERM and PAR ERR indicators.
- If either indicator is lit, replace card C48.
 - If both indicators are extinguished, replace cards B20, B34 and C36.

- Step 24. Position rotary switch D at 4 and perform the following observations:
- Observe COUNT = 0 and INTER BC and CB indicators.
 - If all three indicators are extinguished, refer to b).
 - If one or more indicators are lit, replace cards C12, C46 and C48.
 - Observe START I/O and ZERO STA indicators.
 - If both indicators are extinguished, replace cards C22, C27, B35 and C36.
 - If either indicator is lit, replace card C12.

- Step 25. At A display, observe CONTROL BYTE REGISTER (A1) indicators.
- If more than one indicator is lit, perform Step 26.
 - If a single indicator is lit, replace card C26.

- Step 26. Position rotary switch D at 4 and observe START I/O and ZERO STA indicators.
- If both indicators are extinguished, perform Step 27.
 - If either indicator is lit, replace cards C46 and C48.

- Step 27. Position rotary switch C at 4 and observe RD FLAGS indicator.
- If lit, replace cards B20 and C19.
 - If extinguished, replace card B20.

- Step 28. Determine type of console printer being used.
- If an Incremental Printer, perform Step 29.
 - If a Model 35 Teletypewriter, perform Step 30.

- Step 29. At A display, perform the following:
- Observe FONT MARK and SPT indicators.
 - If both indicators are lit, refer to b).
 - If both indicators are extinguished, refer to c).
 - If only one indicator is lit, replace card E25.

- b) Press CONSOLE CLEAR switch and at A display observe FONT MARK and SPT indicators.
 - 1) If both indicators are extinguished, refer to c).
 - 2) If both indicators are lit, replace card E10.
- c) Observe INPUT REGISTER (X1) indicators.
 - 1) If all indicators are extinguished, refer to d).
 - 2) If a single indicator is lit, replace card E19.
 - 3) If more than one indicator is lit, replace cards D22, D23 and C33.
- d) Observe IMM END indicator.
 - 1) If extinguished, refer to e).
 - 2) If lit, replace card E08.
- e) Observe SENSE REGISTER CMD REJ and BUS CK indicators.
 - 1) If both indicators are extinguished, refer to f).
 - 2) If only one indicator is lit, replace card E15.
 - 3) If both indicators are lit, replace cards D22, D23 and C33.
- f) Observe STATUS REGISTER indicators.
 - 1) If all five indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace cards E15, D22, D23 and C33.

Step 30. At A display, perform the following:

- a) Observe FONT MARK and SPT indicators.
 - 1) If both indicators are lit, refer to b).
 - 2) If both indicators are extinguished, perform Step 29c).
 - 3) If only one indicator is lit, replace card E26.
- b) Press CONSOLE CLEAR switch and at A display observe FONT MARK and SPT indicators.
 - 1) If both indicators are extinguished, perform Step 31.
 - 2) If both indicators are lit, replace card E10.

Step 31. Ensure rotary switch D is at 4 and observe COUNT = 0 and INTER BC and CB indicators.

- a) If all three indicators are extinguished, perform Step 32.
- b) If one or more indicators are lit, replace card C12.

Step 32. Position rotary switch B at 5 and observe ON LINE indicator.

- a) If lit, perform Step 33.
- b) If extinguished, perform Step 35.

Step 33. At D display, perform the following:

- a) Observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SUP OUT indicator.
 - 1) If lit, refer to b).
 - 2) If extinguished, replace card E10.
- b) Observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS CMD OUT and SRV OUT indicators.
 - 1) If either indicator is lit, perform Step 34.
 - 2) If both indicators are extinguished, replace card C14.

Step 34. Position rotary switch C at 1 and observe ASC II CODE indicator.

- a) If lit, replace cards B36 and C36.
- b) If extinguished, replace card C22.

Step 35. At D display, observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SEL OUT indicator.

- a) If lit, perform Step 36.
- b) If extinguished, replace cards C05 and E11.

- Step 36. Position rotary switch C at 4 and observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS REQ IN indicator.
 a) If lit, replace card C12.
 b) If extinguished, replace cards C14 and C17.
- Step 37. At A display, observe INTER-FACE BLK indicator.
 a) If lit, perform Step 38.
 b) If extinguished, perform Step 40.
- Step 38. Position rotary switch B at 6 and observe CHAIN FLAG indicator.
 a) If lit, perform Step 39.
 b) If extinguished, replace card D14.
- Step 39. Position rotary switch C at 6 and observe INTER-FACE BLK indicator.
 a) If lit, replace card C46.
 b) If extinguished, replace cards D14 and D56.
- Step 40. At A display, perform the following:
 a) Observe ADDRESS REGISTER-SELECTOR CHANNEL 1 (C3) indicator 15.
 1) If extinguished, refer to b).
 2) If lit, perform Step 48.
 b) Observe ADDRESS REGISTER-SELECTOR CHANNEL 1 (C3) indicators 16 through 31.
 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 2) If a single indicator is lit, note the indicator number (for use in Step 47) and perform Step 41.
 3) If more than one indicator is lit, replace cards listed below opposite indicators that are lit.

<u>C3 Indicators</u>	<u>Replace Cards</u>
16	D39 and D47
17	D39 and D47
18	D39 and D47
19	D39 and D47
20	D38 and D47
21	D38 and D47
22	D38 and D47
23	D38 and D47
24	D37 and D47
25	D37 and D47
26	D37 and D47
27	D37 and D47
28	D34 and D47
29	D34 and D47
30	D34 and D47
31	D34 and D47

- Step 41. Press CLOCK RATE CLEAR switch.
- Step 42. Press CLOCK RATE PHASE indicator-switch.

- Step 43. Press CLOCK PHASE CLEAR switch.
- Step 44. Press CLOCK PHASE 2 indicator-switch.
- Step 45. Press CLOCK RATE PHASE REPEAT indicator-switch.
- Step 46. Position rotary switch C at 8 and press WR NEXT CCW ADR 16-31 indicator-switch.
- Step 47. Press RUN switch and observe A6 display for ADDRESS REGISTER-SELECTOR CHANNEL 1 (C3) indicator noted in Step 40b), condition 2).
- If indicator is now extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - If indicator is still lit, replace corresponding card listed below.

<u>C3 Indicator</u>	<u>Replace Card</u>
16	D39
17	D39
18	D39
19	D39
20	D38
21	D38
22	D38
23	D38
24	D37
25	D37
26	D37
27	D37
28	D34
29	D34
30	D34
31	D34

- Step 48. Ensure rotary switch B is at 6 and observe TRANSFER REGISTER-SELECTOR CHANNEL 1 indicators 16, 17, 18 and 19.
- If all four indicators are lit, perform Step 49.
 - If all four indicators are extinguished, replace cards D53, D20 and D15.
- Step 49. Ensure rotary switch C is at 6 and observe ADDRESS REGISTER-SELECTOR CHANNEL 2 (C7) indicator 15.
- If lit, perform Phase Enable Manual Test in paragraph 4-2g, page 4-48.
 - If extinguished, replace card D35.
- Step 50. At A display, perform the following:
- Observe RD DATA, SER IN ONE SHOT, and CHAN PRI LOCKOUT indicators.
 - If all three indicators are extinguished, refer to b).
 - If a single indicator is lit, replace card E53.
 - If any two indicators are lit, replace cards E55, E53 and C46.

- b) Observe CHAN PRI indicator.
 - 1) If lit, refer to c).
 - 2) If extinguished, refer to e).
- c) Observe BUSY indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace card E37, D36 and C33.
- d) Observe CHAN PRI REQ indicator.
 - 1) If lit, perform Step 51.
 - 2) If extinguished, replace card E53.
- e) Observe START I/OA, START I/OB, and CHAN ACT indicators.
 - 1) If all three indicators are extinguished, refer to f).
 - 2) If any two indicators are lit, replace cards E55 and E52.
 - 3) If a single indicator is lit, replace corresponding cards listed below.

<u>Indicator</u>	<u>Replace Cards</u>
START I/OA	E52 and C21
START I/OB	E52 and E51
CHAN ACT	E52, E51 and E55

- f) Observe BUSY indicator.
 - 1) If extinguished, refer to g).
 - 2) If lit, replace card E52.
- g) Observe INTERFACE ADR OUT, OPL IN, ADR IN, and SUP OUT indicators.
 - 1) If all four indicators are extinguished, refer to h).
 - 2) If more than one indicator is lit, replace cards E55 and E39.
 - 3) If a single indicator is lit, replace corresponding card(s) listed below.

<u>Indicator</u>	<u>Replace Card(s)</u>
ADR OUT	E39 and E51
OPL IN	E39 and E30
ADR IN	E39 and E30
SUP OUT	E39

- h) Observe INTERFACE CMD OUT and SRV OUT indicators.
 - 1) If both indicators are extinguished, refer to i).
 - 2) If either indicator is lit, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
- i) Observe INTERFACE STA IN and SRV IN indicators.
 - 1) If both indicators are extinguished, refer to j).
 - 2) If either indicator is lit, replace cards E53 and E04.
- j) Observe INTERFACE SEL OUT indicator.
 - 1) If extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If lit, replace cards E46, E51 and E55.

Step 51. Position rotary switch B at 7 and observe STATUS DESIGNATORS CHAN END and DEV END indicators.

- a) If either indicator is lit, replace cards D36 and C33.
- b) If both indicators are extinguished, replace cards E43, E47, E33 and E45.

Step 52. At A display, perform the following:

- a) Observe RD DATA, SRV IN ONE SHOT, and CHAN PRI LOCKOUT indicators.
 - 1) If all three indicators are extinguished, refer to b).
 - 2) If a single indicator is lit, replace card D52.
 - 3) If any two indicators are lit, replace cards D52 and D56.
- b) Observe CHAN PRI indicator.
 - 1) If lit, refer to c).
 - 2) If extinguished, refer to e).
- c) Observe BUSY indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace card D46.
- d) Observe CHAN PRI REQ indicator.
 - 1) If extinguished, replace card D52.
 - 2) If lit, replace cards D19, D24, D44 and D16.
- e) Observe START I/OA, START I/OB, and CHAN ACT indicators.
 - 1) If all three indicators are extinguished, refer to f).
 - 2) If any two indicators are lit, replace cards D51 and D56.
 - 3) If a single indicator is lit, replace corresponding cards listed below.

<u>Indicator</u>	<u>Replace Cards</u>
START I/OA	D51 and C21
START I/OB	D51 and D50
CHAN ACT	D51, D50 and D32

- f) Observe BUSY indicator.
 - 1) If extinguished, refer to g).
 - 2) If lit, replace card D51.
- g) Observe INTERFACE ADR OUT, OPL IN, ADR IN, and SUP OUT indicators.
 - 1) If all four indicators are extinguished, refer to h).
 - 2) If more than one indicator is lit, replace cards D56 and D13.
 - 3) If a single indicator is lit, replace corresponding card(s) listed below.

<u>Indicator</u>	<u>Replace Card(s)</u>
ADR OUT	D13 and D50
OPL IN	D13 and D11
ADR IN	D13 and D11
SUP OUT	D13

- h) Observe INTERFACE CMD OUT and SRV OUT indicators.
 - 1) If both indicators are extinguished, refer to i).
 - 2) If either indicator is lit, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
- i) Observe INTERFACE STA IN and SRV IN indicators.
 - 1) If both indicators are extinguished, refer to j).
 - 2) If either indicator is lit, replace cards D52 and D04.
- j) Observe INTERFACE SEL OUT indicator.
 - 1) If extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If lit, replace cards D40, D50 and D56.

(3) B display manual test. - The following procedure is performed to isolate and correct malfunctions in the circuitry indicated by the B display on the maintenance panel.

Step 1. Note current position of rotary switch B, then refer to step specified below for that switch position.

<u>Switch Position</u>	<u>Perform Step</u>
1	2
2	4
3	7
4	8
5	9
6	10
7	11
8	12

Step 2. At B display, perform the following:

- a) Observe PSW INTERMASK BIN OVFL and DEC OVFL indicators.
 - 1) If both indicators are extinguished, refer to b).
 - 2) If either indicator is lit, perform Step 3.
- b) Observe OPERATION CODE (F0) indicators.
 - 1) If all indicators are extinguished, refer to c).
 - 2) If more than one indicator is lit, replace cards B21, A35, C48 and C46.
 - 3) If a single indicator is lit, replace card A35.
- c) Observe R1 (F0) and R2 (F0) indicators.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If a single indicator is lit, replace card B32.
 - 3) If more than one indicator is lit, replace cards B32 and B21.

Step 3. Position rotary switch C at 1 and observe PROBLEM REG SET and PROBLEM STATE indicators.

- a) If both indicators are extinguished, replace card B39.
- b) If either indicator is lit, replace cards C46 and C48.

Step 4. Determine type of console printer being used.

- a) If an Incremental Printer, perform Step 5.
- b) If a Model 35 Teletypewriter, perform Step 6.

Step 5. At B display, observe SENSE REGISTER INTV REQ and EQUIP CHK indicators.

- a) If both indicators are extinguished, perform Step 6.
- b) If both indicators are lit, replace cards E22 and E10.
- c) If only EQUIP CHK indicator is lit, replace card E22.
- d) If only INTV REQ indicator is lit, replace cards E22 and E07.

Step 6. Observe B0 REGISTER indicators 16 through 23.

- a) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
- b) If one or more indicators are lit, replace cards B22, A51 and A53.

Step 7. At B display, perform the following:

- a) Observe WR ADR SEQ indicators.
 - 1) If both indicators are extinguished, refer to b).

- 2) If both indicators are lit, replace cards A44, A36, C46 and C48.
- b) Observe RD ADR SEQ indicator 30.
 - 1) If extinguished, refer to c).
 - 2) If lit, replace cards A56 and A36.
- c) Observe RD ADR SEQ indicators 31, 32, and 33.
 - 1) If all indicators are extinguished, refer to d).
 - 2) If one or more indicators are lit, replace card A44.
- d) Observe GENL SEQ indicators 34 and 35.
 - 1) If both indicators are extinguished, refer to e).
 - 2) If both indicators are lit, replace card A44.
- e) Observe RD OP 1 and 2, COUNT, and WR OP 1 indicators.
 - 1) If all four indicators are extinguished, refer to f).
 - 2) If one or more indicators are lit, replace cards A45, A38 and C48.
- f) Observe GENL SEQ indicators 40 and 41.
 - 1) If both indicators are extinguished, refer to g).
 - 2) If either indicator is lit, replace cards A45 and A36.
- g) Observe INCR ADR SEQ indicators.
 - 1) If all four indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If indicator 42 is lit, replace cards A56 and A36.
 - 3) If indicator 43 is lit, replace cards A44 and A56.
 - 4) If indicators 44 and 45 are lit, replace card A45.

Step 8. At B display, perform the following:

- a) Observe START I/O SEQ indicators.
 - 1) If all indicators are extinguished, refer to b).
 - 2) If one or more indicators are lit, replace cards C12 and C17.
- b) Observe LD DEV ADR SEQ indicator.
 - 1) If extinguished, refer to c).
 - 2) If lit, replace cards C19, C12 and C10.
- c) Observe LD I/O REG SEQ and ACK SEQ indicators.
 - 1) If both indicators are extinguished, refer to d).
 - 2) If either indicator is lit, replace cards C18, C10 and C12.
- d) Observe FAST ACK SEQ indicator.
 - 1) If extinguished, refer to e).
 - 2) If lit, replace card B16.
- e) Observe STA TRANS and WR DEV NUM SEQ indicators.
 - 1) If both indicators are extinguished, refer to f).
 - 2) If both indicators are lit, replace cards C20, C10 and C12.
- f) Observe LD COND CODE SEQ indicator.
 - 1) If extinguished, refer to g).
 - 2) If lit, replace cards C19, C11 and C12.
- g) Observe CHAN ACT and REQUEST DATA, STATUS, TIMER, and ARITH indicators.
 - 1) If all five indicators are extinguished, refer to h).
 - 2) If all five indicators are lit, replace cards C14 and C12.
- h) Observe ARITH LOCKOUT indicator.
 - 1) If extinguished, refer to i).
 - 2) If lit, replace cards C17, C11 and C12.
- i) Observe STACK indicator.
 - 1) If extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If lit, replace cards C14 and C12.

- Step 9. At B display, perform the following:
- a) Observe INPUT HLD DES and STATUS HLD DES indicators.
 - 1) If both indicators are extinguished, refer to b).
 - 2) If both indicators are lit, replace cards E08, E10 and C12.
 - 3) If only INPUT HLD DES indicator is lit, replace card E08.
 - 4) If only STATUS HLD DES indicator is lit, replace cards E08 and E12.
 - b) Observe INTERFACE TAGS and CONTROLS OPL IN, ADR IN, STA IN, and SRV IN indicators.
 - 1) If all four indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, replace card E08, E10 and C12.
 - c) Observe INTERFACE TAGS AND CONTROLS REQ IN indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace cards E11, E10 and C12.
 - d) Observe CONSOLE SEQUENCE indicators.
 - 1) If all indicators are extinguished, refer to e).
 - 2) If one or more indicators are lit, replace cards E07, E10 and C12.
 - e) Observe SEL OUT PASS, SEL HOLD, REQ START, and ADR START indicators.
 - 1) If all four indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace cards E11, E10 and C12.
- Step 10. At B display, perform the following:
- a) Observe CHAIN FLAG indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card D14.
 - b) Observe TRANSFER REGISTER-SELECTOR CHANNEL 1 indicator 15.
 - 1) If extinguished, refer to c).
 - 2) If lit, replace cards D15 and D53.
 - c) Observe TRANSFER REGISTER-SELECTOR CHANNEL 1 indicators 16 through 31.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If all indicators are lit, replace card D56.
 - 3) If any indicator in group 16 through 19 is lit, replace cards D39, D47 and D56.
 - 4) If any indicator in group 20 through 23 is lit, replace cards D38, D47 and D56.
 - 5) If any indicator in group 24 through 27 is lit, replace cards D37, D47 and D56.
 - 6) If any indicator in group 28 through 31 is lit, replace cards D34, D47 and D56.
- Step 11. At B display, perform the following:
- a) Observe OUT INTERFACE REQ IN and SEL IN indicators.
 - 1) If both indicators are extinguished, refer to b).
 - 2) If both indicators are lit, replace cards E55 and E46.
 - 3) If only SEL IN indicator is lit, replace cards E55 and E46.
 - 4) If only REQ IN indicator is lit, replace cards E55, E46 and E04.
 - b) Observe COMMAND DESIGNATORS indicators.
 - 1) If all five indicators are extinguished, refer to c).

- 2) If a single indicator is lit, replace card E42.
- 3) If more than one indicator is lit, replace cards E42, E50 and E55.
- c) Observe STATUS DESIGNATORS indicators.
 - 1) If all four indicators are extinguished, refer to d).
 - 2) If a single indicator is lit, replace card E40.
 - 3) If more than one indicator is lit, replace cards E40, E45, E55 and E34.
- d) Observe PARITY ERROR INPUT indicator.
 - 1) If extinguished, refer to e).
 - 2) If lit, replace cards E43 and C46.
- e) Observe PARITY ERROR OUTPUT indicator.
 - 1) If extinguished, refer to f).
 - 2) If lit, replace cards E31, E36, E29 and E55.
- f) Observe I/O ADDER indicators.
 - 1) If all three indicators are extinguished, refer to g).
 - 2) If ADD indicator is lit, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 3) If either or both INC indicators are lit, replace cards E31 and E55.
- g) Observe INTERRUPT indicators.
 - 1) If both indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If either indicator is lit, replace cards E43 and E55.

Step 12. At B display, perform the following:

- a) Observe OUT INTERFACE REQ IN and SEL IN indicators.
 - 1) If both indicators are extinguished, refer to b).
 - 2) If both indicators are lit, replace cards D40 and D56.
 - 3) If only SEL IN indicator is lit, replace cards D40 and D56.
 - 4) If only REQ IN indicator is lit, replace cards D40, D04 and D56.
- b) Observe COMMAND DESIGNATORS indicators.
 - 1) If all five indicators are extinguished, refer to c).
 - 2) If a single indicator is lit, replace card D15.
 - 3) If more than one indicator is lit, replace cards D15, D56 and D48.
- c) Observe STATUS DESIGNATORS indicators.
 - 1) If all four indicators are extinguished, refer to d).
 - 2) If a single indicator is lit, replace card D14.
 - 3) If more than one indicator is lit, replace cards D14, D20, D44 and D56.
- d) Observe PARITY ERROR INPUT indicator.
 - 1) If extinguished, refer to e).
 - 2) If lit, replace cards D16 and C46.
- e) Observe PARITY ERROR OUTPUT indicator.
 - 1) If extinguished, refer to f).
 - 2) If lit, replace cards D12, D45, D10 and F56.
- f) Observe I/O ADDER indicators.
 - 1) If all three indicators are extinguished, refer to g).
 - 2) If ADD indicator is lit, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 3) If either or both INC indicators are lit, replace cards D12 and D56.

- g) Observe INTERRUPT indicators.
 - 1) If both indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If either indicator is lit, replace cards D16 and D56.

(4) C display manual test. - The following procedure is performed to isolate and correct malfunctions in the circuitry indicated by the C display on the maintenance panel.

- Step 1. Note current position of rotary switch C, then refer to step specified below for that switch position.

<u>Switch Position</u>	<u>Perform Step</u>
1	2
2	3
3	8
4	9
5	10
6	12
7	13
8	14

- Step 2. At C display, perform the following:

- a) Observe PSW INTERRUPT MASK (PØ) indicators.
 - 1) If all indicators are extinguished, refer to b).
 - 2) If any indicators are lit, replace corresponding card(s) listed below.

<u>PØ Indicators</u>	<u>Replace Card(s)</u>
WR PROT	B42
TIMER	B42
SEL 1	B41
SEL 2	B41
PRGM	B38
SEL 1, SEL 2, and MPX SH	C20 and C12
MPX SH and MPX NSH	B39
Any Other Condition	B19, C48 and B36

- b) Observe PSW INTERRUPT CODE (PØ) indicators.
 - 1) If all four indicators are extinguished, refer to c).
 - 2) If any indicators are lit, replace corresponding card(s) listed below.

<u>PØ Indicators</u>	<u>Replace Cards</u>
08	B37
09	B37
10	B31
11	B31

<u>PØ Indicators</u>	<u>Replace Cards</u>
08 and 09	B37
10 and 11	B31
Any Other Condition	B47, C48 and B36

- c) Observe ASC II CODE indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace cards B30 and B19.
- d) Observe PROBLEM REG SET and PROBLEM STATE indicators.
 - 1) If both indicators are extinguished, refer to d).
 - 2) If either indicator is lit, replace cards B29 and B19.
- e) Observe ILC (PØ) indicators.
 - 1) If both indicators are extinguished, refer to e).
 - 2) If either or both indicators are lit, replace cards B24 and B19.
- f) Observe COND CODE (PØ) indicators.
 - 1) If both indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If either or both indicators are lit, replace cards B41 and B19.

- Step 3. Determine type of console printer being used.
- a) If an Incremental Printer, perform Step 4.
 - b) If a Model 35 Teletypewriter, perform Step 7.

- Step 4. At C display, observe MARGIN SWITCH RIGHT and LEFT indicators.
- a) If RIGHT indicator is lit, perform Step 5.
 - b) If LEFT indicator is lit, perform Step 6.
 - c) If both indicators are lit, replace cards E25 and E10.
 - d) If both indicators are extinguished, perform Step 7.

- Step 5. Observe position of printer print wheel.
- a) If print wheel is at extreme right, perform Step 7.
 - b) If print wheel is not at extreme right, replace cards E25 and E10.

- Step 6. Observe position of printer print wheel.
- a) If print wheel is at extreme left, perform Step 7.
 - b) If print wheel is not at extreme left, replace cards E25 and E10.

- Step 7. Observe DØ REGISTER indicators.
- a) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - b) If three or more indicators are lit, replace cards B47, C48 and C46.
 - c) If one or two indicators are lit, replace corresponding card listed below.

<u>DØ Indicators</u>	<u>Replace Card</u>
16, 17	B42
18, 19	B41
20, 21	B39
22, 23	B38
24, 25	B37

<u>DØ Indicators</u>	<u>Replace Card</u>
26, 27	B31
28, 29	B30
30, 31	B29

- Step 8. At C display, perform the following:
- Observe ARITHMETIC CONTROL SEQUENCER INST 1, INST 2, B2 LOW, and B2 UP indicators.
 - If all four indicators are extinguished, refer to b).
 - If one or more indicators are lit, replace card A26.
 - Observe ARITHMETIC CONTROL SEQUENCER X2 LOW, X2 UP, OP2 LOW, OPL LOW, WR LOW, OP2 UP, and OPL UP indicators.
 - If all seven indicators are extinguished, refer to c).
 - If one or more indicators are lit, replace card A24.
 - Observe ARITHMETIC CONTROL SEQUENCER RD P, SHIFT A, and SHIFT P indicators.
 - If all three indicators are extinguished, refer to d).
 - If one or more indicators are lit, replace cards A22, C48 and C46.
 - Observe PASS 2 and PASS 3 indicators.
 - If both indicators are extinguished, refer to e).
 - If either indicator is lit, replace card A22.
 - Observe ZERO CK (16-31) indicator.
 - If extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - If lit, replace cards A18, C46 and C48.
- Step 9. At C display, perform the following:
- Observe RD BCW INDEX, RD FLAGS, RD ADR, RD COUNT, WR COUNT, and WR ADR indicators.
 - If all six indicators are extinguished, refer to b).
 - If a single indicator is lit, replace card C19.
 - If more than one indicator is lit, replace cards C19, C12, C46 and C48.
 - Observe DATA TRANS 1, DATA TRANS 2, DATA TRANS 3, UPDATE BCW1, WR BCW INDEX and WR FLAGS indicators.
 - If all six indicators are extinguished, refer to c).
 - If only one indicator is lit, replace card C18.
 - If more than one indicator is lit, replace cards C18 and C12.
 - Observe MULTIPLEXER INPUT INTERFACE TAGS AND CONTROLS indicators.
 - If all six indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - If only REQ IN indicator is lit, replace cards C17 and C12.
 - If any other condition exists, replace card C13.
- Step 10. Determine type of console printer being used.
- If an Incremental Printer, perform Step 11a).
 - If a Model 35 Teletypewriter, perform Step 11b).
- Step 11. At C display, perform the following:
- Observe INCREMENTAL PRINTER CONTROL (X8) indicators.
 - If all seven indicators are extinguished, refer to c).
 - If one or more indicators are lit, replace cards E21 and E10.
 - Observe CHARACTER COUNTER indicators.
 - If all six indicators are extinguished, refer to c).

- 2) If one or more indicators are lit, replace cards E22 and E10.
- c) Observe INITL SEL LOW, DATA UP DES, DATA LOW DES, and END UP BES indicators.
 - 1) If all four indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace cards E21 and E10.

Step 12. At C display, perform the following:

- a) Observe INTER-FACE BLK indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace cards E40 and E55.
- b) Observe ADDRESS REGISTER-SELECTOR CHANNEL 2 (C7) indicators.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace corresponding card(s) listed below.

<u>C7 Indicators</u>	<u>Replace Cards</u>
15	E42
16	D29, E38, E55 and D36
17	D29, E38, E55 and D36
18	D29, E38, E55 and D36
19	D29, E38, E55 and D36
20	D28, E38, E55 and D36
21	D28, E38, E55 and D36
22	D28, E38, E55 and D36
23	D28, E38, E55 and D36
24	D27, E38, E55 and D36
25	D27, E38, E55 and D36
26	D27, E38, E55 and D36
27	D27, E38, E55 and D36
28	D26, E38, E55 and D36
29	D26, E38, E55 and D36
30	D26, E38, E55 and D36
31	D26, E38, E55 and D36

Step 13. At C display, perform the following:

- a) Observe BYTE COUNT = 0 indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card E55.
- b) Observe CMD ADR SEQ SEL 1 indicators.
 - 1) If all three indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, replace cards E51 and E55.
- c) Observe SEL OUT SEQ indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace cards E51 and E55.
- d) Observe RD CMD, SEQ T812, SEQ T815, and GEN NEXT CCW ADR indicators.
 - 1) If all four indicators are extinguished, refer to e).

- 2) If one or more indicators are lit, replace cards E50 and E55.
- e) Observe WR NEXT CCW ADR indicators and RD BYTE COUNT indicator.
 - 1) If all three indicators are extinguished, refer to f).
 - 2) If one or more indicators are lit, replace card E48.
- f) Observe STORAGE REF indicator.
 - 1) If extinguished, refer to g).
 - 2) If lit, replace card E47.
- g) Observe UPDATE indicators.
 - 1) If both indicators are extinguished, refer to h).
 - 2) If either indicator is lit, replace cards E47 and E55.
- h) Observe ADR IN indicators and SEL IN 2 indicator.
 - 1) If all three indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace card E46.

Step 14. At C display, perform the following:

- a) Observe BYTE COUNT = 0 indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card D56.
- b) Observe CMD ADR SEQ SEL 2 indicators.
 - 1) If all three indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, replace cards D50 and D56.
- c) Observe SEL OUT SEQ indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace cards D50 and D56.
- d) Observe RD CMD, SEQ T612, SEQ T615, and GEN NEXT CCW ADR indicators.
 - 1) If all four indicators are extinguished, refer to e).
 - 2) If one or more indicators are lit, replace cards D48 and D56.
- e) Observe WR NEXT CCW ADR indicators and RD BYTE COUNT indicator.
 - 1) If all three indicators are extinguished, refer to f).
 - 2) If one or more indicators are lit, replace card D43.
- f) Observe STORAGE REF indicator.
 - 1) If extinguished, refer to g).
 - 2) If lit, replace card D42.
- g) Observe UPDATE indicators.
 - 1) If both indicators are extinguished, refer to h).
 - 2) If either indicator is lit, replace cards D42 and D56.
- h) Observe ADR IN indicators and SEL IN 2 indicator.
 - 1) If all three indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace card D40.

(5) D display manual test. - The following procedure is performed to isolate and correct malfunctions in the circuitry indicated by the D display on the maintenance panel.

Step 1. Note current position of rotary switch D, then refer to step specified below for that switch position.

<u>Switch Position</u>	<u>Perform Step</u>
1	2
2	3
3	4
4	5
5	6

<u>Switch Position</u>	<u>Perform Step</u>
6	7
7	8
8	9

Step 2. At D display, perform the following:

- a) Observe PSW INSTRUCTION ADDRESS (PØ) indicator 47.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace cards B54, A30, C46 and C48.
- b) Observe PSW INSTRUCTION ADDRESS (PØ) indicators 48 through 63.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace corresponding cards listed below.

<u>PØ Indicators</u>	<u>Replace Cards</u>
48	B63, B50, A30 and B34
49	B63, B50, A30 and B34
50	B63, B50, A30 and B34
51	B63, B50, A30 and B34
52	B63, B50, A30 and B34
53	B63, B50, A30 and B34
54	B63, B50, A30 and B34
55	B63, B50, A30 and B34
56	B57, B50, A30 and B34
57	B57, B50, A30 and B34
58	B56, B50, A30 and B34
59	B56, B50, A30 and B34
60	B59, B50, A30 and B34
61	B59, B50, A30 and B34
62	B58, B50, A30 and B34

Step 3. At D display, perform the following:

- a) Observe AØ REGISTER indicator 15.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace cards B42, B47, C48 and C46.
- b) Observe AØ REGISTER indicators 16 through 31.
 - 1) If extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If lit, replace corresponding cards listed below.

<u>AØ Indicators</u>	<u>Replace Cards</u>
16	B60, B24, A30, C46, C48 and B34
17	B60, B24, A30, C46, C48 and B34
18	B60, B24, A30, C46, C48 and B34
19	B60, B24, A30, C46, C48 and B34

<u>A0 Indicators</u>	<u>Replace Cards</u>
20	B55, B24, A30, C46, C48 and B34
21	B55, B24, A30, C46, C48 and B34
22	B55, B24, A30, C46, C48 and B34
23	B55, B24, A30, C46, C48 and B34
24	B60, B24, A30, C46, C48 and B34
25	B60, B24, A30, C46, C48 and B34
26	B60, B24, A30, C46, C48 and B34
27	B60, B24, A30, C46, C48 and B34
28	B55, B24, A30, C46, C48 and B34
29	B55, B24, A30, C46, C48 and B34
30	B55, B24, A30, C46, C48 and B34
31	B55, B24, A30, C46, C48 and B34

- Step 4. At D display, perform the following:
- a) Observe I/O FLAG REGISTER (A1) TERM and PAR ERR indicators.
 - 1) If both indicators are extinguished, refer to b).
 - 2) If either indicator is lit, replace cards B37, B20, C46 and C48.
 - b) Observe I/O FLAG REGISTER (A1) PAR and ODD PAR indicators.
 - 1) If both indicators are extinguished, refer to c).
 - 2) If either indicator is lit, replace cards B31, B20, C46 and C48.
 - c) Observe I/O FLAG REGISTER (A1) CB CK and DECR ADR indicators.
 - 1) If both indicators are extinguished, refer to d).
 - 2) If either indicator is lit, replace cards B30, B20, C46 and C48.
 - d) Observe I/O FLAG REGISTER (A1) WRITE indicator.
 - 1) If extinguished, refer to e).
 - 2) If lit, replace cards B29, B20, C46 and C48.
 - e) Observe INTERRUPT SEQUENCE indicators.
 - 1) If all four indicators are extinguished, refer to f).
 - 2) If one or more indicators are lit, replace card A26.
 - f) Observe INTERRUPT REQ indicators.
 - 1) If both indicators are extinguished, refer to g).
 - 2) If only PRGM indicator is lit, replace card A16.
 - 3) If only TIMER indicator or both PRGM and TIMER indicators are lit, replace cards A16, C46 and C48.
 - g) Observe STOR WR CTRL indicators.
 - 1) If both indicators are extinguished, refer to h).
 - 2) If either indicator is lit, replace cards A25, A41 and B36.
 - h) Observe NEG SIGN indicator.
 - 1) If extinguished, refer to i).
 - 2) If lit, replace cards A18, C46 and C48.
 - i) Observe CARRY OUT and CARRY IN indicators.
 - 1) If both indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If either indicator is lit, replace card A25.

- Step 5. At D display, perform the following:
- a) Observe FIRST PASS indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace card C08.
 - b) Observe BCW OP CODE, 65K CARRY, BIT 15, COUNT = 0, and INTER indicators.
 - 1) If all nine indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, replace cards C15 and C12.
 - c) Observe START I/O and ZERO STA indicators and MULTIPLEXER OUTPUT INTERFACE DESIGNATORS REJECT indicator.
 - 1) If all three indicators are extinguished, refer to d).
 - 2) If one or more indicators are lit, replace cards C12, C48 and C46.
 - d) Observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS SEL OUT indicator.
 - 1) If extinguished, refer to e).
 - 2) If lit, replace cards C17 and C12.
 - e) Observe MULTIPLEXER OUTPUT INTERFACE DESIGNATORS ADR OUT, SRV OUT, CMD OUT, and SUP OUT indicators.
 - 1) If all four indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace card C13.
- Step 6. At D display, perform the following:
- a) Observe INITIAL LOAD WAIT and LOAD indicators.
 - 1) If both indicators are extinguished, refer to b).
 - 2) If either indicator is lit, replace card C21.
 - b) Observe INITIAL LOAD SEQUENCE indicators.
 - 1) If all six indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, replace cards C20 and C12.
 - c) Observe TEST I/O CMD, SENSE CMD, WRITE CMD, and DATA, HLD DES indicators.
 - 1) If all four indicators are extinguished, refer to d).
 - 2) If one or more indicators are lit, replace cards E13 and E10.
 - d) Observe ATTN DES and UNIT EXC DES indicators.
 - 1) If both indicators are extinguished, refer to e).
 - 2) If either indicator is lit, replace cards E14 and E10.
 - e) Observe DATA LOAD and PRINT DES indicators.
 - 1) If both indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If either indicator is lit, replace card E10.
- Step 7. At D display, perform the following:
- a) Observe CHAIN FLAG indicator.
 - 1) If extinguished, refer to b).
 - 2) If lit, replace cards E40 and E55.
 - b) Observe TRANSFER REGISTER SELECTOR CHANNEL 2 (C5) indicator 15.
 - 1) If extinguished, refer to c).
 - 2) If lit, replace cards E42, E54, E55, E34, D36 and C38.
 - c) Observe TRANSFER REGISTER SELECTOR CHANNEL 2 (C5) indicators 16 through 31.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace corresponding cards listed below.

<u>C5 Indicators</u>	<u>Replace Cards</u>
16	D29, E38, E55, D36 and C33
17	D29, E38, E55, D36 and C33
18	D29, E38, E55, D36 and C33
19	D29, E38, E55, D36 and C33
20	D28, E38, E55, D36 and C33
21	D28, E38, E55, D36 and C33
22	D28, E38, E55, D36 and C33
23	D28, E38, E55, D36 and C33
24	D27, E38, E55, D36 and C33
25	D27, E38, E55, D36 and C33
26	D27, E38, E55, D36 and C33
27	D27, E38, E55, D36 and C33
28	D26, E38, E55, D36 and C33
29	D26, E38, E55, D36 and C33
30	D26, E38, E55, D36 and C33
31	D26, E38, E55, D36 and C33

- Step 8. At D display, perform the following:
- a) Observe STATUS SEQ and END STATUS SEQ indicators.
 - 1) If all five indicators are extinguished, refer to b).
 - 2) If one or more indicators are lit, replace card E45.
 - b) Observe NO INTER STA and START STA SEQ indicators.
 - 1) If all four indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, replace card E48.
 - c) Observe BUFFER REGISTER SELECTOR CHANNEL 2 (V6) PARITY indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace cards D44, E36, E29, E55, D36 and C33.
 - d) Observe BUFFER REGISTER SELECTOR CHANNEL 2 (V6) indicators 00 through 07.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b, page 4-26.
 - 2) If one or more indicators are lit, replace corresponding cards listed below.

<u>V6 Indicators</u>	<u>Replace Cards</u>
00	D31 and E37
01	D31 and E37
02	D31 and E37
03	D31 and E37
04	D30 and E37
05	D30 and E37
06	D30 and E37
07	D30 and E37

- Step 9. At D display, perform the following:
- a) Observe STATUS SEQ and END STATUS SEQ indicators.
 - 1) If all five indicators are extinguished, refer to b).
 - 2) If one or more indicators are lit, replace card D44.
 - b) Observe NO INTER STA and START STA SEQ indicators.
 - 1) If all four indicators are extinguished, refer to c).
 - 2) If one or more indicators are lit, replace card D43.
 - c) Observe BUFFER REGISTER SELECTOR CHANNEL 1 (V2) PARITY indicator.
 - 1) If extinguished, refer to d).
 - 2) If lit, replace cards D17, D45, D10, D35 and C38.
 - d) Observe BUFFER REGISTER SELECTOR CHANNEL 1 (V2) indicators 00 through 07.
 - 1) If all indicators are extinguished, perform Maintenance Read/Write Manual Test in paragraph 4-2b.
 - 2) If one or more indicators are lit, replace corresponding cards listed below.

<u>V2 Indicators</u>	<u>Replace Cards</u>
00	D24, D46 and D35
01	D24, D46 and D35
02	D24, D46 and D35
03	D24, D46 and D35
04	D18, D46 and D35
05	D18, D46 and D35
06	D18, D46 and D35
07	D18, D46 and D35

b. Maintenance Read/Write Manual Test. - This test is performed to manually check the operation of processor circuitry used to manually write data into memory and read data from memory.

- Step 1. Press SWITCH ENABLE switch to active position.
- Step 2. Press DISABLE TIMER switch to active position.
- Step 3. Press MAINTENANCE WRITE switch to active position.
- Step 4. Observe CLOCK RATE INST indicator.
 - a) If lit, perform Step 5.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 5. Position rotary switch A at 1 and observe MAINT RD/WR indicator.
 - a) If lit, perform Step 6.
 - b) If extinguished, probe Item 1 in Table 4-1, page 4-29.
- Step 6. Position rotary switch C at 2, then attempt to set all DØ REGISTER bits.
 - a) If all indicators light, perform Step 7.
 - b) If any indicator fails to light, probe all items listed for failing bit in Table 4-2, page 4-30.
- Step 7. Press RUN switch five times.
- Step 8. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 0008, perform Step 9.

- b) If register equals any other value, perform SØ Adder Manual Test in paragraph 4-2d, page 4-40.
- Step 9. Return MAINTENANCE WRITE switch to inactive position.
- Step 10. Press SYSTEM RESET switch.
- Step 11. Press MAINTENANCE READ switch to active position.
- Step 12. At A display, observe MAINT RD/WR indicator.
 - a) If lit, perform Step 13.
 - b) If extinguished, probe Item 3 in Table 4-1, page 4-29.
- Step 13. Press RUN switch.
- Step 14. At C display, observe DØ REGISTER indicators.
 - a) If all indicators are lit, perform Step 15.
 - b) If one or more indicators are extinguished, perform Step 31.
- Step 15. Press RUN switch four times.
- Step 16. At C display, observe DØ REGISTER indicators.
 - a) If all indicators are lit, perform Step 17.
 - b) If one or more indicators are extinguished, perform Step 31.
- Step 17. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 0008, perform Step 18.
 - b) If register equals any other value, perform SØ Adder Manual Test in paragraph 4-2d, page 4-40.
- Step 18. Return MAINTENANCE READ switch to inactive position.
- Step 19. Press SYSTEM RESET switch.
- Step 20. Press MAINTENANCE WRITE switch to active position.
- Step 21. Press RUN switch five times.
- Step 22. Press MAINTENANCE WRITE switch to inactive position.
- Step 23. Press SYSTEM RESET switch.
- Step 24. Press MAINTENANCE READ switch to active position.
- Step 25. Press RUN switch.
- Step 26. At C display, observe DØ REGISTER indicators.
 - a) If all indicators are extinguished, perform Step 27.
 - b) If one or more indicators are lit, perform Step 31.
- Step 27. Press RUN switch four times.
- Step 28. At C display, observe DØ REGISTER indicators.
 - a) If all indicators are extinguished, perform Step 29.
 - b) If one or more indicators are lit, perform Step 31.
- Step 29. Return MAINTENANCE READ switch to inactive position.
- Step 30. Press SYSTEM RESET switch, then perform storage manual test detailed in paragraph 4-3b(7), page 4-132.
- Step 31. Press SYSTEM RESET switch.
- Step 32. Press MAINTENANCE WRITE switch to active position.
- Step 33. Press CLOCK RATE CLEAR switch.
- Step 34. Press CLOCK RATE PHASE indicator-switch.

- Step 35. Observe CLOCK PHASE 4 indicator.
a) If lit, perform Step 36.
b) If extinguished, probe Item 4 in Table 4-1, page 4-29.
- Step 36. At C display, set all DØ REGISTER bits.
- Step 37. Press RUN switch four times.
- Step 38. Position rotary switch D at 3 and observe STOR WR CTRL WR UP and WR LOW indicators.
a) If both indicators are lit, perform Step 39.
b) If both indicators are extinguished, probe Item 8 in Table 4-1, page 4-29.
c) If only one indicator is lit, replace card A25.
- Step 39. Press RUN switch twice.
- Step 40. Position rotary switch D at 2 and observe AØ REGISTER indicators.
a) If all indicators are extinguished, perform Step 41.
b) If one or more indicators are lit, probe Item 10 in Table 4-1, page 4-29.
- Step 41. Press RUN switch.
- Step 42. At D display, observe AØ REGISTER indicators.
a) If all indicators are lit, perform Step 43.
b) If one or more indicators are extinguished, probe Item 1 in Table 4-3, page 4-31.
- Step 43. Position rotary switch D at 3 and observe STOR WR CTRL WR UP and WR LOW indicators.
a) If both indicators are extinguished, perform Step 44.
b) If either or both indicators are lit, replace card A25.
- Step 44. Press C display CLEAR switch.
- Step 45. Press RUN switch.
- Step 46. At C display, observe DØ REGISTER indicators.
a) If all indicators are lit, perform Step 47.
b) If one or more indicators are extinguished, probe Item 1 in Table 4-4, page 4-34.
- Step 47. Press MAINTENANCE WRITE switch to inactive position.
- Step 48. Press SYSTEM RESET switch.
- Step 49. Press MAINTENANCE READ switch to active position.
- Step 50. Press CLOCK RATE CLEAR switch.
- Step 51. Press CLOCK RATE PHASE indicator-switch.
- Step 52. Observe CLOCK PHASE 4 indicator.
a) If lit, perform Step 53.
b) If extinguished, probe Item 5 in Table 4-1, page 4-29.
- Step 53. Press RUN switch four times.
- Step 54. At D display, observe STOR WR CTRL WR UP and WR LOW indicators.
a) If both indicators are extinguished, perform Step 55.
b) If either or both indicators are lit, probe Item 14 in Table 4-1, page 4-30.
- Step 55. Press RUN switch four times.

- Step 56. At C display, observe DØ REGISTER indicators.
- If all indicators are lit, perform Instruction Rate Program Load Investigation detailed in paragraph 3-2b, page 3-
 - If one or more indicators are extinguished, probe Item 1 in Table 4-5, page 4-35.
- Step 57. Press MAINTENANCE READ switch to inactive position.
- Step 58. Press SYSTEM RESET switch.
- Step 59. Press MAINTENANCE WRITE switch to active position.
- Step 60. Press ADDRESS COMPARE WRITE STOP switch to active position.
- Step 61. Press ADDRESS COMPARE switches 15 through 30 to 0 position.
- Step 62. Press RUN switch.
- Step 63. Observe CLOCK PHASE 3 indicator and LOGIC STOP ADDRESS COMPARE indicator.
- If both indicators are lit, then perform storage manual test detailed in paragraph 4-3b(7), page 4-132.
 - If one or both indicators are extinguished, probe Item 1 in Table 4-6, page 4-38.

Table 4-1. Maintenance Read/Write Test Monitor Probe Table, Part 1

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
1	153	C48	36	If extinguished replace card C48 If lit probe Item 2
2	503	A23	10	If lit replace card A23 If extinguished replace card A09
3	153	C48	35	If lit replace card C48 If extinguished replace card A09
4	151	C51	09	If extinguished replace card C51 If lit probe Item 5
5	156	C45	06	If lit replace card C45 If extinguished probe Item 6
6	152	C49	33	If lit probe Item 7 If extinguished replace card C52
7	152	C49	23	If lit replace card C49 If extinguished replace card C52
8	512	A25	26	If lit replace card A25 If extinguished probe Item 9
9	503	A23	10	If lit replace card A23 If extinguished replace card A09
10	215	B60	21	If extinguished replace card B60 If lit probe Item 12
11	216	B55	21	If extinguished replace card B55 If lit probe Item 13
12	288	B24	06	If lit replace card B24 If extinguished replace card A30

Table 4-1. Maintenance Read/Write Test Monitor Probe Table, Part 1 (Continued)

<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
13	288	B24	09	If lit replace card B24 If extinguished replace card A30
14	512	A25	26	If extinguished replace card A25 If lit replace card A23

Table 4-2. Maintenance Read/Write Test Monitor Probe Table, Part 2

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
16	1	189	B02	51	If lit replace card B02 If extinguished probe Item 2
	2	247	B28	50	If lit replace card B28 If extinguished replace card B42
17	3	189	B02	49	If lit replace card B02 If extinguished probe Item 4
	4	247	B28	52	If lit replace card B28 If extinguished replace card B42
18	5	189	B02	48	If lit replace card B02 If extinguished probe Item 6
	6	247	B28	53	If lit replace card B28 If extinguished replace card B41
19	7	189	B02	47	If lit replace card B02 If extinguished probe Item 8
	8	247	B28	44	If lit replace card B28 If extinguished replace card B41
20	9	189	B02	45	If lit replace card B28 If extinguished probe Item 10
	10	247	B28	15	If lit replace card B28 If extinguished replace card B39
21	11	189	B02	44	If lit replace card B02 If extinguished probe Item 12
	12	247	B28	19	If lit replace card B28 If extinguished replace card B39
22	13	189	B02	17	If lit replace card B02 If extinguished probe Item 14
	14	247	B28	22	If lit replace card B28 If extinguished replace card B38
23	15	189	B02	19	If lit replace card B02 If extinguished strobe Item 16
	16	247	B28	10	If lit replace card B28 If extinguished replace card B38

Table 4-2. Maintenance Read/Write Test Monitor Probe Table, Part 2 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
24	17	189	B02	21	If lit replace card B02 If extinguished replace card B37
25	18	189	B02	24	If lit replace card B02 If extinguished replace card B37
26	19	189	B02	26	If lit replace card B02 If extinguished replace card B31
27	20	189	B02	36	If lit replace card B02 If extinguished replace card B31
28	21	189	B02	43	If lit replace card B02 If extinguished replace card B30
29	22	189	B02	42	If lit replace card B02 If extinguished replace card B30
30	23	189	B02	41	If lit replace card B02 If extinguished replace B29
31	24	189	B02	39	If lit replace card B02 If extinguished replace card B29

Table 4-3. Maintenance Read/Write Test Monitor Probe Table, Part 3

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	1	215	B60	27	If extinguished probe Item 2 If lit probe Item 3
	2	216	B55	27	If extinguished probe Item (5 through 20) corresponding to indicator that is extinguished If lit probe Item 4
	3	285	B45	50	If lit replace card B45 If extinguished replace card A30
	4	285	B45	45	If lit replace card B45 If extinguished replace card A30
16	5	215	B60	04	If extinguished probe Item 37 If lit probe Item 21
17	6	215	B60	17	If extinguished probe Item 39 If lit probe Item 22
18	7	215	B60	07	If extinguished probe Item 40 If lit probe Item 23
19	8	215	B60	19	If extinguished probe Item 42 If lit probe Item 24
20	9	216	B55	04	If extinguished probe Item 43 If lit probe Item 25

Table 4-3. Maintenance Read/Write Test Monitor Probe Table, Part 3 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
21	10	216	B55	17	If extinguished probe Item 45 If lit probe Item 26
22	11	216	B55	07	If extinguished probe Item 46 If lit probe Item 27
23	12	216	B55	19	If extinguished probe Item 48 If lit probe Item 28
24	13	215	B60	31	If extinguished probe Item 49 If lit probe Item 29
25	14	215	B60	52	If extinguished probe Item 50 If lit probe Item 30
26	15	215	B60	37	If extinguished probe Item 51 If lit probe Item 31
27	16	215	B60	49	If extinguished probe Item 52 If lit probe Item 32
28	17	216	B55	31	If extinguished probe Item 53 If lit probe Item 33
29	18	216	B55	52	If extinguished probe Item 54 If lit probe Item 34
30	19	216	B55	37	If extinguished probe Item 55 If lit probe Item 35
31	20	216	B55	49	If extinguished probe Item 56 If lit probe Item 36
	21	255	C43	18	If lit replace card C43 If extinguished replace card C42
	22	255	C43	22	If lit replace card C43 If extinguished replace card C42
	23	255	C43	20	If lit replace card C43 If extinguished replace card C42
	24	255	C43	04	If lit replace card C43 If extinguished replace card C42
	25	255	C43	11	If lit replace card C43 If extinguished replace card C40
	26	255	C43	03	If lit replace card C43 If extinguished replace card C40
	27	255	C43	12	If lit replace card C43 If extinguished replace card C40
	28	255	C43	15	If lit replace card C43 If extinguished replace card C40
	29	255	C43	40	If lit replace card C43 If extinguished replace card C39
	30	255	C43	32	If lit replace card C43 If extinguished replace card C39

Table 4-3. Maintenance Read/Write Test Monitor Probe Table, Part 3 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	31	255	C43	51	If lit replace card C43 If extinguished replace card C39
	32	255	C43	52	If lit replace card C43 If extinguished replace card C39
	33	255	C43	45	If lit replace card C43 If extinguished replace card C38
	34	255	C43	36	If lit replace card C43 If extinguished replace card C38
	35	255	C43	47	If lit replace card C43 If extinguished replace card C38
	36	255	C43	48	If lit replace card C43 If extinguished replace card C38
	37	239	B42	27	If lit probe Item 38 If extinguished replace card B60
	38	193	B06	51	If lit replace card B06 If extinguished replace card B42
	39	193	B06	49	If lit replace card B06 If extinguished replace card B60
	40	240	B41	27	If lit probe Item 41 If extinguished replace card B60
	41	193	B06	48	If lit replace card B06 If extinguished replace card B41
	42	193	B06	47	If lit replace card B06 If extinguished replace card B60
	43	241	B39	27	If lit probe Item 44 If extinguished replace card B55
	44	193	B06	45	If lit replace card B06 If extinguished replace card B39
	45	193	B06	44	If lit replace card B06 If extinguished replace card B55
	46	242	B38	27	If lit probe Item 47 If extinguished replace card B55
	47	193	B06	17	If lit replace card B06 If extinguished replace card B38
	48	193	B06	19	If lit replace card B06 If extinguished replace card B55
	49	193	B06	21	If lit replace card B06 If extinguished replace card B60
	50	193	B06	24	If lit replace card B06 If extinguished replace card B60
	51	193	B06	26	If lit replace card B06 If extinguished replace card B60

Table 4-3. Maintenance Read/Write Test Monitor Probe Table, Part 3 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	52	193	B06	36	If lit replace card B06 If extinguished replace card B60
	53	193	B06	43	If lit replace card B06 If extinguished replace card B55
	54	193	B06	42	If lit replace card B06 If extinguished replace card B55
	55	193	B06	41	If lit replace card B06 If extinguished replace card B55
	56	193	B06	39	If lit replace card B06 If extinguished replace card B55

Table 4-4. Maintenance Read/Write Test Monitor Probe Table, Part 4

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	1	239	B42	35	If extinguished probe Item 2 If lit probe Item 3
	2	243	B37	37	If extinguished replace cards listed in Items 5 through 20 for indicators that are extinguished If lit probe Item 4
	3	289	B23	25	If lit replace card B23 If extinguished replace card A23
	4	289	B23	28	If lit replace card B23 If extinguished replace card A23
16	5	239	B42		Replace card B42
17	6	239	B42		Replace card B42
18	7	240	B41		Replace card B41
19	8	240	B41		Replace card B41
20	9	241	B39		Replace card B39
21	10	241	B39		Replace card B39
22	11	242	B38		Replace card B38
23	12	242	B38		Replace card B38
24	13	243	B37		Replace card B37
25	14	243	B37		Replace card B37
26	15	244	B31		Replace card B31
27	16	244	B31		Replace card B31
28	17	245	B30		Replace card B30
29	18	245	B30		Replace card B30

Table 4-4. Maintenance Read/Write Test Monitor Probe Table, Part 4 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
30	19	246	B29		Replace card B29
31	20	246	B29		Replace card B29

Table 4-5. Maintenance Read/Write Test Monitor Probe Table, Part 5

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	1	239	B42	39	If extinguished probe Item 5 If lit probe Item 2
	2	285	B45	07	If lit replace card B45 If extinguished probe Item 3
	3	403	A43	38	If lit replace card A43 If extinguished probe Item 4
	4	503	A23	04	If lit replace card A23 If extinguished replace card A09
	5	239	B42	06	If extinguished probe Item 7 If lit probe Item 6
	6	285	B45	04	If lit replace card B45 If extinguished probe Item 3
	7	243	B37	26	If extinguished probe Item 9 If lit probe Item 8
	8	285	B45	21	If lit replace card B45 If extinguished probe Item 3
	9	243	B37	35	If extinguished probe Item 11 If lit probe Item 10
	10	285	B45	14	If lit replace card B45 If extinguished probe Item 3
	11	245	B30	26	If extinguished probe Item 13 If lit probe Item 12
	12	285	B45	28	If lit replace card B45 If extinguished probe Item 3
	13	245	B30	35	If extinguished probe Items (15 through 62) corresponding to indicators that are extinguished If lit probe Item 14
	14	285	B45	25	If lit replace card B45 If extinguished probe Item 3
16	15	239	B42	40	If extinguished probe Item 16 If lit probe Item 17
	16	239	B42	38	If lit replace card B42 If extinguished probe Item 17

Table 4-5. Maintenance Read/Write Test Monitor Probe Table, Part 5 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	17	236	C32	36	If extinguished replace card C32 If lit perform Step 57 in para 4-2b, page 4-29
17	18	239	B42	05	If extinguished probe Item 19 If lit probe Item 20
	19	239	B42	10	If lit replace card B42 If extinguished probe Item 20
	20	236	C32	30	If extinguished replace card C32 If lit perform Step 57 in para 4-2b, page 4-29
18	21	240	B41	40	If extinguished probe Item 22 If lit probe Item 23
	22	240	B41	38	If lit replace card B41 If extinguished probe Item 23
	23	236	C32	27	If extinguished replace card C32 If lit perform Step 57 in para 4-2b, page 4-29
19	24	240	B41	05	If extinguished probe Item 25 If lit probe Item 26
	25	240	B41	10	If lit replace card B41 If extinguished probe Item 26
	26	236	C32	24	If extinguished replace card C32 If lit perform Step 57 in para 4-2b, page 4-29
20	27	241	B39	40	If extinguished probe Item 28 If lit probe Item 29
	28	241	B39	38	If lit replace card B39 If extinguished probe Item 29
	29	236	C32	03	If extinguished replace card C32 If lit perform Step 57 in para 4-2b, page 4-29
21	30	241	B39	05	If extinguished probe Item 31 If lit probe Item 32
	31	241	B39	10	If lit replace card B39 If extinguished probe Item 32
	32	236	C32	05	If extinguished replace card C32 If lit perform Step 57 in para 4-2b, page 4-29
22	33	242	B38	40	If extinguished probe Item 34 If lit probe Item 35
	34	242	B38	38	If lit replace card B38 If extinguished probe Item 35

Table 4-5. Maintenance Read/Write Test Monitor Probe Table, Part 5 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	35	236	C32	09	If extinguished replace card C32 If lit perform Step 57 in para 4-2b, page 4-29
23	36	242	B38	05	If extinguished probe Item 37 If lit probe Item 38
	37	242	B38	10	If lit replace card B38 If extinguished probe Item 38
	38	237	C31	36	If extinguished replace card C31 If lit perform Step 57 in para 4-2b, page 4-29
24	39	243	B37	38	If extinguished probe Item 40 If lit probe Item 41
	40	243	B37	29	If lit replace card B37 If extinguished probe Item 41
	41	237	C31	30	If extinguished replace card C31 If lit perform Step 57 in para 4-2b, page 4-29
25	42	243	B37	40	If extinguished probe Item 43 If lit probe Item 44
	43	243	B37	04	If lit replace card B37 If extinguished probe Item 44
	44	237	C31	27	If extinguished replace card C31 If lit perform Step 57 in para 4-2b, page 4-29
26	45	244	B31	38	If extinguished probe Item 46 If lit probe Item 47
	46	244	B31	29	If lit replace card B31 If extinguished probe Item 47
	47	237	C31	24	If extinguished replace card C31 If lit perform Step 57 in para 4-2b, page 4-29
27	48	244	B31	40	If extinguished probe Item 49 If lit probe Item 50
	49	244	B31	04	If lit replace card B31 If extinguished probe Item 50
	50	237	C31	03	If extinguished replace card C31 If lit perform Step 57 in para 4-2b, page 4-29
28	51	245	B30	38	If extinguished probe Item 52 If lit probe Item 53
	52	245	B30	29	If lit replace card B30 If extinguished probe Item 53

Table 4-5. Maintenance Read/Write Test Monitor Probe Table, Part 5 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	53	237	C31	05	If extinguished replace card C31 If lit perform Step 57 in para 4-2b, page 4-29
29	54	245	B30	40	If extinguished probe Item 55 If lit probe Item 56
	55	245	B30	04	If lit replace card B30 If extinguished probe Item 56
	56	237	C31	09	If extinguished replace card C31 If lit perform Step 57 in para 4-2b, page 4-29
30	57	246	B29	38	If extinguished probe Item 58 If lit probe Item 59
	58	246	B29	29	If lit replace card B29 If extinguished probe Item 59
	59	238	C30	36	If extinguished replace card C30 If lit perform Step 57 in para 4-2b, page 4-29
31	60	246	B29	40	If extinguished probe Item 61 If lit probe Item 62
	61	246	B29	04	If lit replace card B29 If extinguished probe Item 62
	62	238	C30	30	If extinguished replace card C30 If lit perform Step 57 in para 4-2b, page 4-29

Table 4-6. Maintenance Read/Write Test Monitor Probe Table, Part 6

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	1	154	C47	47	If lit probe Item 2 If extinguished replace card A10
	2	154	C47	53	If extinguished probe Item 3 If lit replace card C54
	3	154	C47	54	If extinguished probe Item 4 If lit replace card C54
	4	154	C47	15	If extinguished replace card C47 If lit probe Item 5
	5	223	C53	17	If lit probe Item 6 If extinguished replace card C56
	6	223	C53	18	If lit probe Item 7 If extinguished replace card C56

Table 4-6. Maintenance Read/Write Test Monitor Probe Table, Part 6 (Continued)

<u>BIT</u>	<u>ITEM</u>	<u>FIG.</u>	<u>CARD LOC.</u>	<u>PIN</u>	<u>REMARKS</u>
	7	223	C53	19	If lit probe Item 8 If extinguished replace card C56
	8	223	C53	15	If lit probe Item 9 If extinguished replace card C56
	9	223	C53	14	If lit probe Item 10 If extinguished replace card C56
	10	223	C53	13	If lit probe Item 11 If extinguished replace card C56
	11	223	C53	12	If lit probe Item 12 If extinguished replace card C55
	12	223	C53	11	If lit probe Item 13 If extinguished replace card C55
	13	223	C53	52	If lit probe Item 14 If extinguished replace card C55
	14	223	C53	53	If lit probe Item 15 If extinguished replace card C55
	15	223	C53	54	If lit probe Item 16 If extinguished replace card C55
	16	223	C53	51	If lit probe Item 17 If extinguished replace card C55
	17	223	C53	50	If lit probe Item 18 If extinguished replace card C54
	18	223	C53	49	If lit probe Item 19 If extinguished replace card C54
	19	223	C53	48	If lit probe Item 20 If extinguished replace card C54
	20	223	C53	47	If lit replace card C53 If extinguished replace card C54

c. Clear Main Storage Procedure. - The following procedure is performed to manually write zeros in all memory locations.

- Step 1. Press SYSTEM RESET switch.
- Step 2. Press MAINTENANCE WRITE switch to active position.
- Step 3. Press CLOCK RATE CLEAR switch.
- Step 4. Observe CLOCK RATE indicators.
 - a) If all indicators are extinguished, perform Step 5.
 - b) If one or more indicators are lit, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 5. Press CLOCK RATE NORMAL indicator-switch.

- Step 6. Observe CLOCK RATE NORMAL indicator.
 - a) If lit, perform Step 7.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 7. Press RUN switch.
- Step 8. Position rotary switch D at 1 and observe PSW INSTRUCTION ADDRESS (PØ) which should be counting sequentially from right to left at a very rapid rate.
 - a) If register is counting correctly, indicating zeros are being written in all memory locations, perform Step 9.
 - b) If register is not counting, perform SØ Adder Manual Test in paragraph 4-2d.
- Step 9. Press STOP switch.
- Step 10. Press MAINTENANCE WRITE switch to inactive position.
- Step 11. Press SYSTEM RESET switch.

d. SØ Adder Manual Test. - The following procedure is performed to isolate and correct the cause of malfunctions affecting proper operation of the SØ adder circuitry.

- Step 1. Ensure DECREMENT STORAGE ADDRESS switch and ADDRESS COMPARE READ STOP and WRITE STOP switches are in inactive position.
- Step 2. Press MAINTENANCE READ switch to active position.
- Step 3. Observe CLOCK RATE INST indicator.
 - a) If lit, perform Step 4.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 4. Press DISCONNECT FØ switch to active position.
- Step 5. Press SYSTEM RESET switch.
- Step 6. Press CLOCK RATE CLEAR switch and observe CLOCK RATE indicators.
 - a) If all indicators are extinguished, perform Step 7.
 - b) If one or more indicators are lit, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 7. Press and then observe CLOCK RATE PHASE indicator-switch.
 - a) If lit, perform Step 8.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 8. Observe CLOCK PHASE 4 indicator.
 - a) If lit, perform Step 9.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 9. Position rotary switch A at 1 and observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 00000, perform Step 11.
 - b) If register equals any other value, perform Step 10.
- Step 10. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators 15 through 31.
 - a) If more than one indicator is lit, replace cards B46 and B48.

- b) If a single indicator is lit, replace card(s) listed in Table 4-7, page 4-44, opposite indicator that is lit.
- Step 11. Press RUN switch six times, then observe CLOCK PHASE 2 indicator.
 - a) If lit, perform Step 12.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 12. Position rotary switch D at 1 and observe PSW INSTRUCTION ADDRESS (PØ) indicators.
 - a) If all indicators are extinguished, perform Step 13.
 - b) If more than one indicator is lit, replace cards B50 and B47.
 - c) If a single indicator is lit, replace cards listed in Table 4-8, page 4-44, opposite indicator that is lit.
- Step 13. Press SYSTEM RESET switch.
- Step 14. Press CLOCK RATE CLEAR switch.
- Step 15. Press CLOCK RATE PHASE indicator-switch.
- Step 16. At D display, set PSW INSTRUCTION STORAGE (PØ) to 1FFFF. All indicators should light and remain lit.
 - a) If correct condition exists, perform Step 17.
 - b) If any indicator fails to light and remain lit, replace cards listed in Table 4-8, page 4-44, opposite indicator that is extinguished.
- Step 17. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If all indicators are extinguished, perform Step 18.
 - b) If more than one indicator is lit, replace card B51.
 - c) If a single indicator is lit, replace card(s) listed in Table 4-7, page 4-44, opposite indicator that is lit.
- Step 18. Press RUN switch four times.
- Step 19. At A display, observe STORAGE ADDRESS REGISTER (SØ) indicators.
 - a) If register equals 1FFFF, perform Step 20.
 - b) If register equals 10000, replace cards A33 and A26.
 - c) If a single bit is in error, replace card(s) listed in Table 4-7, page 4-44, opposite bit in error.
 - d) If any other condition exists, replace card B51.
- Step 20. Press SYSTEM RESET switch.
- Step 21. Press CLOCK RATE CLEAR switch.
- Step 22. Press CLOCK RATE PHASE indicator-switch.
- Step 23. Press RUN switch twice.
- Step 24. Position rotary switch B at 3, then press WR OP 1 indicator switch.
- Step 25. Press RUN switch five times.
- Step 26. At D display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.
 - a) If register equals 00001, replace cards B44, B43, A26 and A23.
 - b) If register equals 00002, replace cards A42, A26 and A23.
 - c) If register equals 00003, perform Step 27.
 - d) If register equals any other value, replace cards B44, B43 and B58.
- Step 27. Press CLOCK RATE INST indicator-switch.

- Step 28. Press SYSTEM RESET switch.
- Step 29. Press CLOCK RATE CLEAR switch.
- Step 30. Press CLOCK RATE PHASE indicator switch.
- Step 31. Press DISCONNECT FØ switch to inactive position.
- Step 32. Press D display CLEAR switch, then set PSW INSTRUCTION ADDRESS (PØ) to 1FFFE.
- Step 33. Press RUN switch twice.
- Step 34. At D display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.
- a) If register equals 00000, perform Step 35.
 - b) If register equals 10000, replace cards B54 and B44.
 - c) If a single bit is in error, replace cards listed in Table 4-10, page 4-45, opposite error bit.
 - d) If any other condition exists, replace cards B44 and B43.
- Step 35. Press D display CLEAR switch, then set PSW INSTRUCTION ADDRESS (PØ) to 1FFFD.
- Step 36. Press RUN switch.
- Step 37. At D display, observe PSW STORAGE ADDRESS (PØ) indicators.
- a) If register equals 1FFFF, perform Step 38.
 - b) If a single bit is in error, replace cards listed in Table 4-10, page 4-45, opposite error bit.
 - c) If any other condition exists, replace cards B44 and B43.

NOTE

Steps 38 through 48 check SØ Adder's ability to increment 16.

- Step 38. Press SYSTEM RESET switch.
- Step 39. Press MAINTENANCE READ switch to inactive position.
- Step 40. Press MAINTENANCE WRITE switch to active position.
- Step 41. Press CLOCK RATE CLEAR switch.
- Step 42. Press CLOCK RATE PHASE indicator-switch.
- Step 43. Press RUN switch four times.
- Step 44. Position rotary switch B at 1, then set OPERATION CODE (FØ) bits 00, 03, and 04.
- Step 45. Press RUN switch three times.
- Step 46. At D display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.
- a) If register equals 00012, perform Step 49.
 - b) If register equals any other value, perform Step 47.
- Step 47. Position rotary switch C at 3 and observe ARITHMETIC CONTROL SEQUENCER WR UP indicator.
- a) If lit, perform Step 48.
 - b) If extinguished, replace cards C48 and A23.
- Step 48. At D display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.
- a) If register equals 00000, replace cards A42 and B44.
 - b) If register equals any other value, replace cards B43 and B44.

NOTE

Steps 49 through 55 check SØ Adder's ability to increment 4.

- Step 49. Press SYSTEM RESET switch.
- Step 50. Press CLOCK RATE CLEAR switch.
- Step 51. Press CLOCK RATE PHASE indicator-switch.
- Step 52. Press RUN switch four times.
- Step 53. Ensure rotary switch B is at 1, then set OPERATION CODE (FØ) bits 00 and 03.
- Step 54. Press RUN switch four times.
- Step 55. At D display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.
 - a) If register equals 00006, perform Step 56.
 - b) If register equals any other value, replace cards B43, B44 and A28.

NOTE

Steps 56 through 65 check the SØ Adder's ability to subtract.

- Step 56. Press MAINTENANCE WRITE switch to inactive position.
- Step 57. Press CLOCK RATE INST indicator switch.
- Step 58. Press SYSTEM RESET switch.
- Step 59. Press CLOCK RATE CLEAR switch.
- Step 60. Press CLOCK RATE PHASE indicator-switch.
- Step 61. Press RUN switch twice.
- Step 62. Position rotary switch B at 3, then press the following indicator-switches: RD OP2, RD OP1, COUNT, and WR OP1.
- Step 63. Press RUN switch five times.
- Step 64. At D display, observe PSW INSTRUCTION ADDRESS (PØ) indicators.
 - a) If register equals 1FFFD, replace cards B43 and B44.
 - b) If register equals any other value, perform Step 65.
- Step 65. At B display, observe the following indicators: RD OP2, RD OP1, COUNT, and WR OP1.
 - a) If all four indicators are lit, replace cards B43 and B44.
 - b) If one or more indicators are extinguished, replace cards A45 and A42.

Table 4-7. S0 Adder Test Error Bit Listing, Part 1

<u>S0 BIT</u>	<u>REPLACE CARD(S)</u>
15	B54 and A33
16	B63
17	B63
18	B63
19	B63
20	B63
21	B62
22	B62
23	B62
24	B57
25	B57
26	B56
27	B56
28	B59
29	B59
30	B58
31	B58

Table 4-8. S0 Adder Test Error Bit Listing, Part 2

<u>P0 BIT</u>	<u>REPLACE CARD</u>
47	B54
48	B63
49	B63
50	B63
51	B63
52	B63
53	B62
54	B62
55	B62
56	B57
57	B57
58	B56
59	B56
60	B59
61	B59
62	B58
63	B58

Table 4-9. SØ Adder Test Error Bit Listing, Part 3

<u>PØ BIT</u>	<u>REPLACE CARD(S)</u>
16	B44
17	B44
18	B44
19	B44
20	B44
21	B44
22	B44
23	B44
24	B43
25	B43
26	B43
27	B44 and B43
28	B43
29	B44 and B43
30	B44 and B43
31	B44 and B43

Table 4-10. SØ Adder Test Error Bit Listing, Part 4

<u>PØ BIT</u>	<u>REPLACE CARDS</u>
47	
48	B44 and B63
49	B44 and B63
50	B44 and B63
51	B44 and B63
52	B44 and B63
53	B44 and B63
54	B44 and B63
55	B44, B62 and B43
56	B57 and B43
57	B57 and B43
58	B56 and B43
59	B56 and B43
60	B59 and B43
61	B59 and B43
62	B58 and B43
63	B58 and B43

e. Cycle Counter Manual Test. - The following procedure is performed to isolate and correct the cause of malfunctions affecting proper operation of the cycle counter circuitry.

- Step 1. Position rotary switches A, B, C, and D as follows:
 - a) Rotary switch A at 2.
 - b) Rotary switch B at 5.
 - c) Rotary switch C at 1.
 - d) Rotary switch D at 5.
- Step 2. Press and then observe CLOCK RATE INST indicator-switch.
 - a) If lit, perform Step 3.
 - b) If extinguished, replace card C52.
- Step 3. Ensure DECREMENT STORAGE ADDRESS switch, MAINTENANCE READ and WRITE switches, and ADDRESS COMPARE READ STOP and WRITE STOP switches are in inactive position.
- Step 4. Set the following switches as indicated.
 - a) SWITCH ENABLE to active position.
 - b) CONSOLE OFF LINE to inactive position.
 - c) LOAD ADDRESS CHANNEL NUMBER to 0.
 - d) LOAD ADDRESS CONTROL UNIT NUMBER to 8.
 - e) LOAD ADDRESS DEVICE NUMBER to 0.
- Step 5. Press SYSTEM RESET switch.
- Step 6. Press and then observe CYCLE COUNT indicator-switch.
 - a) If lit, perform Step 7.
 - b) If extinguished, replace card C49.
- Step 7. Press and then observe CLOCK RATE CYCLE indicator-switch.
 - a) If lit, perform Step 8.
 - b) If extinguished, replace card C52.
- Step 8. Observe CLOCK PHASE 4 indicator.
 - a) If lit, perform Step 9.
 - b) If extinguished, replace cards C49, C51 and C45.
- Step 9. Press A display CLEAR switch, then observe CLOCK CYCLE COUNTER (MØ) indicators.
 - a) If all indicators are extinguished, perform Step 10.
 - b) If one or more indicators are lit, replace cards C49 and C48.
- Step 10. At A display, set CLOCK CYCLE COUNTER (MØ) to 06.
 - a) If able to set register to proper value, perform Step 11.
 - b) If unable to set register to proper value, replace card C49.
- Step 11. Press LOAD switch.
- Step 12. Press RUN switch.
- Step 13. At A display, observe CLOCK CYCLE COUNTER (MØ) indicators.
 - a) If all indicators are extinguished, perform Step 14.
 - b) If one or more indicators are lit, replace cards C49, C51 and C45.
- Step 14. Position rotary switch A at 1.

Step 15. Observe that all indicators listed below are lit.

<u>Location</u>	<u>Indicator Group</u>	<u>Indicators</u>
Operator Panel	LOAD	WAIT, NO DATA, LOAD CHECK
A1 Display	STORAGE ADDRESS REGISTER (SØ)	Bits 23, 27, 29, 30
C1 Display	PSW INTERRUPT MASK (PØ)	SEL 1, SEL 2, MPX SH
D5 Display	INITIAL LOAD SEQUENCE	6
D5 Display	INITIAL LOAD	LOAD, WAIT

- a) If all indicators are lit, perform Step 16.
- b) If one or more indicators are extinguished, replace cards C49 and C51.

Step 16. Position rotary switch A at 2.

Step 17. Press CLOCK RATE INST indicator-switch.

Step 18. Press SYSTEM RESET switch.

Step 19. Press CYCLE COUNT indicator-switch.

Step 20. Press CLOCK RATE PHASE indicator-switch.

Step 21. Press A display CLEAR switch, then observe CLOCK CYCLE COUNTER (MØ) indicators.

- a) If all indicators are extinguished, perform Step 22.
- b) If one or more indicators are lit, replace cards C49 and C48.

Step 22. Press RUN switch.

Step 23. At A display, observe CLOCK CYCLE COUNTER (MØ) indicators.

- a) If all indicators are lit, replace card C49.
- b) If one or more indicators are extinguished, replace cards C49, C51 and C45.

f. Clock Rate Manual Test. - The following procedure is performed to isolate and correct the cause of malfunctions affecting proper operation of the clock circuitry.

Step 1. Ensure that MAINTENANCE READ and WRITE switches, and ADDRESS COMPARE READ STOP and WRITE STOP switches are in inactive position.

Step 2. Set SWITCH ENABLE switch to active position.

Step 3. Press SYSTEM RESET switch.

Step 4. Observe CLOCK RATE NORMAL indicator.

- a) If lit, perform Step 5.
- b) If extinguished, replace cards C52, C46 and A11.

Step 5. Press CLOCK RATE CLEAR switch.

Step 6. Observe CLOCK RATE NORMAL indicator.

- a) If extinguished, perform Step 7.
- b) If lit, replace cards C52 and A11.

Step 7. Press and then observe CLOCK RATE INST indicator-switch.

- a) If lit, perform Step 8.
- b) If extinguished, replace card C52.

Step 8. Press CLOCK RATE CLEAR switch.

- Step 9. Observe CLOCK RATE INST indicator.
 - a) If extinguished, perform Step 10.
 - b) If lit, replace cards C52 and A11.
- Step 10. Press CLOCK RATE CYCLE indicator-switch.
- Step 11. Observe CLOCK RATE CYCLE indicator.
 - a) If lit, perform Step 12.
 - b) If extinguished, replace card C52.
- Step 12. Observe CLOCK PHASE 4 indicator.
 - a) If lit, perform Step 13.
 - b) If extinguished, replace cards C51, C49 and C45.
- Step 13. Press CLOCK PHASE CLEAR switch.
- Step 14. Observe CLOCK PHASE indicators.
 - a) If all indicators are extinguished, perform Step 15.
 - b) If one or more indicators are lit, replace cards C51 and A11.
- Step 15. Press CLOCK RATE CLEAR switch.
- Step 16. Observe CLOCK RATE CYCLE indicator.
 - a) If lit, replace cards C52 and A11.
 - b) If extinguished, perform Step 17.
- Step 17. Press and then observe CLOCK RATE PHASE indicator-switch.
 - a) If lit, perform Step 18.
 - b) If extinguished, replace card C52.
- Step 18. Observe CLOCK PHASE 4 indicator.
 - a) If lit, perform Step 19.
 - b) If extinguished, replace cards C51, C49 and C45.
- Step 19. Press CLOCK PHASE CLEAR switch.
- Step 20. Observe CLOCK PHASE 4 indicator.
 - a) If lit, replace cards C51 and A11.
 - b) If extinguished, replace cards C52 and A11.

g. Phase Enable Manual Test. - The following procedure is performed to isolate and correct malfunctions that affect the clock phase enables.

- Step 1. Ensure the following switches are in the inactive position: ADDRESS COMPARE, READ STOP and WRITE STOP and MAINTENANCE READ and WRITE.
- Step 2. Press SYSTEM RESET switch.
- Step 3. Observe CLOCK RATE NORMAL indicator.
 - a) If lit, perform Step 3.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 4. Observe CLOCK PHASE indicators.
 - a) If all indicators are extinguished, perform Step 5.
 - b) If one or more indicators are lit, replace corresponding cards listed below.

<u>Indicator</u>	<u>Replace Cards</u>
Phase 1	C47, C45 and C51
Phase 2	D51, E52, C47, C45 and C51
Phase 3	D51, E52, C47, C45 and C51
Phase 4	C47, C45 and C51

- Step 5. Press SYSTEM RESET switch.
- Step 6. Press CLOCK RATE PHASE indicator-switch.
- Step 7. Observe CLOCK PHASE 4 indicator.
 - a) If lit, perform Step 8.
 - b) If extinguished, perform Clock Rate Manual Test in paragraph 4-2f, page 4-47.
- Step 8. Press RUN switch.
- Step 9. Observe CLOCK PHASE 1 indicator.
 - a) If lit, perform Step 10.
 - b) If extinguished, replace cards C52, C51 and C47.
- Step 10. Press RUN switch.
- Step 11. Observe CLOCK PHASE 2 indicator.
 - a) If lit, perform Step 12.
 - b) If extinguished, replace cards C45, C52 and C51.
- Step 12. Press RUN switch.
- Step 13. Observe CLOCK PHASE 3 indicator.
 - a) If lit, replace cards C52 and C51.
 - b) If extinguished, replace cards C47, C52 and C51.

4-3. STORAGE MANUAL TESTS. - The following paragraphs contain manual procedures for isolating and correcting malfunctions that affect the processor's storage section. The procedures are divided into two categories: procedures to isolate and correct program detected malfunctions in the storage section, and procedures to isolate and correct storage section malfunctions that inhibit program loading.

a. Storage Test Error Stop Isolation Procedures. - The following are step-by-step procedures for isolating and correcting storage section malfunctions detected by the Storage Test portion of the DMR. Individual procedures are referenced from the error stop listing in Table 2-1, page 2-9.

(1) Sumcheck test error stop, D1 display (P0) = 01468. - Referral to this paragraph indicates a malfunction occurred in performing a sumcheck of the Storage Test instructions. Perform manual tests starting with procedure in paragraph 4-3b(1), page 4-119.

(2) Bit dimension test for zeros error stop, D1 display (P0) = 01A70. - Referral to this paragraph indicates a malfunction occurred in the bit dimension circuitry (MDR, bit drivers, sense amplifiers and associated circuitry) during the test for zeros. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value in Table 4-12, page 4-50, and replace specified cards on memory chassis of Unit 2.

(3) Bit dimension test for zeros error stop, D1 display (P0) = 01A80. - Referral to this paragraph indicates a malfunction occurred in the bit dimension circuitry (MDR, bit drivers, sense amplifiers and associated circuitry) during the test for zeros. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value in Table 4-11, page 4-50, and replace specified cards on memory chassis of Unit 2.

(4) Bit dimension test for zeros error stop, D1 display (P0) = 01A7C. - Referral to this paragraph indicates a malfunction occurred in the bit dimension circuitry (MDR, bit drivers, sense amplifiers and associated circuitry) during the test for zeros. Perform the following steps:

Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.

Step 2. Locate corresponding A0 value in Table 4-12 and replace specified cards on memory chassis of Unit 1.

Table 4-11. Bit Dimension Test Zeros, Stack 1

<u>A0</u>	<u>REPLACE CARDS*</u>	<u>A0</u>	<u>REPLACE CARDS*</u>
8000	D45, D40 and ABC40	0010	H45, H40 and EFG38
4000	D45, D40 and ABC40	0008	H45, H40 and EFG36
2000	D45, D40 and ABC38	0004	H46, H38 and EFG36
1000	D45, D40 and ABC38	0002	H46, H38 and EFG34
0800	D45, D40 and ABC36	0001	H46, H38 and EFG34
0400	D42, D38 and ABC36	F800	D36
0200	D42, D38 and ABC34	0300	D36 and H20
0100	D42, D38 and ABC34	00F8	H36
0080	H45, H40 and EFG40	0003	H36 and H19
0040	H45, H40 and EFG40	FF00	D34, H20, H12, H05, H07 and H18
0020	H45, H40 and EFG38	00FF	H34, H20, H12, H05, H07 and H18
		FFFF	H11 and H15

Table 4-12. Bit Dimension Test Zeros, Stack 2

<u>A0</u>	<u>REPLACE CARDS*</u>	<u>A0</u>	<u>REPLACE CARDS*</u>
8000	D45, D50 and ABC50	0010	H45, H50 and EFG48
4000	D45, D50 and ABC50	0008	H45, H50 and EFG46
2000	D45, D50 and ABC48	0004	H46, H48 and EFG46
1000	D45, D50 and ABC48	0002	H46, H48 and EFG44
0800	D45, D50 and ABC46	0001	H46, H48 and EFG44
0400	D42, D48 and ABC46	F800	D36 and D51
0200	D42, D48 and ABC44	0300	D36, D51 and H20
0100	D42, D48 and ABC44	00F8	H36 and H51
0080	H45, H50 and EFG50	0003	H36, H51 and H19
0040	H45, H50 and EFG50	FF00	D34, H20, H12, H05, H07 and H18
0020	H45, H50 and EFG48	00FF	H34, H20, H05, H07, H12 and H18

* If unit 1 card replacement does not correct malfunction, refer to paragraph 4-3b(10), page 4-143; if unit 2 card replacement does not correct malfunction, refer to paragraph 4-3b(8), page 4-137.

(5) Bit dimension test for ones error stop, D1 display (P0) = 01ABA. - Referral to this paragraph indicates a malfunction occurred in the bit dimension circuitry (MDR, bit drivers, sense amplifiers, and associated circuitry) during the test for ones. Perform the following steps.

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value in Table 4-14, page 4-52, and replace specified cards on memory chassis of Unit 2.

(6) Bit dimension test for ones error stop, D1 display (P0) = 01ACA. - Referral to this paragraph indicates a malfunction occurred in the bit dimension circuitry (MDR, bit drivers, sense amplifiers, and associated circuitry) during the test for ones. Perform the following steps.

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value in Table 4-13, and replace specified cards on memory chassis of Unit 2.

(7) Bit dimension test for ones error stop, D1 display (P0) = 01AC6. - Referral to this paragraph indicates a malfunction occurred in the bit dimension circuitry (MDR, bit drivers, sense amplifiers, and associated circuitry) during the test for ones. Perform the following steps.

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value in Table 4-14, page 4-52, and replace specified cards on memory chassis of Unit 1.

Table 4-13. Bit Dimension Test Ones, Stack 1

<u>A0</u>	<u>REPLACE CARDS*</u>	<u>A0</u>	<u>REPLACE CARDS*</u>
7FFF	D45, D40 and ABC40	FFEF	H45, H40 and EFG38
BFFF	D45, D40 and ABC40	FFF7	H45, H40 and EFG36
DFFF	D45, D40 and ABC38	FFFB	H46, H38 and EFG36
EFFF	D45, D40 and ABC38	FFFD	H46, H38 and EFG34
F7FF	D45, D40 and ABC36	FFFE	H46, H38 and EFG34
FBFF	D42, D38 and ABC36	07FF	D36
FDFF	D42, D38 and ABC34	FCFF	D36 and H20
FEFF	D42, D38 and ABC34	FF07	H36
FF7F	H45, H40 and EFG40	FFFC	H36 and H19
FFBF	H45, H40 and EFG40	00FF	D34, H20, H12, H05 and H07
FFDF	H45, H40 and EFG38	FF00	H34, H20, H12, H05 and H07
		0000	H11 and H13

* If unit 1 card replacement does not correct malfunction, refer to paragraph 4-3b(10), page 4-143; if unit 2 card replacement does not correct malfunction, refer to paragraph 4-3b(8), page 4-137.

Table 4-14. Bit Dimension Test Ones, Stack 2

<u>A0</u>	<u>REPLACE CARDS*</u>	<u>A0</u>	<u>REPLACE CARDS*</u>
7FFF	D45, D50 and ABC50	FFEF	H45, H50 and EFG48
BFFF	D45, D50 and ABC50	FFF7	H45, H50 and EFG46
DFFF	D45, D50 and ABC48	FFFB	H46, H48 and EFG46
EFFF	D45, D50 and ABC48	FFFD	H46, H48 and EFG44
F7FF	D45, D50 and ABC46	FFFE	H46, H48 and EFG44
FBFF	D42, D48 and ABC46	07FF	D36 and D51
FDFB	D42, D48 and ABC44	FCFF	D36, D51 and H20
FEFF	D42, D48 and ABC44	FF07	H36 and H51
FF7F	H45, H50 and EFG50	FFFC	H36, H51 and H19
FFBF	H45, H50 and EFG50	00FF	D34, H20, H12, H05 and H07
FFDF	H45, H50 and EFG48	FF00	H34, H20, H12, H05 and H07
		0000	H11 and H13

(8) Y dimension failure, D1 display (P0) = 01B80. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 1, unit 2, during the N-SEL zeros test. Perform the following steps.

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
 Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 2.

<u>A0</u>	<u>Replace Cards</u>
80XX	ABC40
40XX	ABC40
20XX	ABC38
10XX	ABC38
08XX	ABC36
04XX	ABC36
02XX	ABC34
01XX	ABC34
Any Other Value	D51, D52, D53, D54 and D55

(9) Y dimension failure, D1 display (P0) = 01B70. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 1, during the N-SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
 Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 1.

* If unit 1 card replacement does not correct malfunction, refer to paragraph 4-3b(10), page 4-143; if unit 2 card replacement does not correct malfunction, refer to paragraph 4-3b(8), page 4-137.

<u>AØ</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46
02XX	ABC44
01XX	ABC44
Any Other Value	D51, C53, C54, C55 and C56

(10) Y dimension failure, D1 display (PØ) = 01B7C. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 1, unit 2, during the N-SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG40
40XX	EFG40
20XX	EFG38
10XX	EFG38
08XX	EFG36
04XX	EFG36
02XX	EFG34
01XX	EFG34
Any Other Value	H51, H52, H53, H54 and H55

(11) Y dimension failure, D1 display (PØ) = 01B6C. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 1, during the N-SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46

<u>A0</u>	<u>Replace Cards</u>
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55, G56 and H51

(12) Y dimension failure, D1 display (P0) = 01B60. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 2, during the N-SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 2.

<u>A0</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46
02XX	ABC44
01XX	ABC44
Any Other Value	D51, C53, C54, C55 and C56

(13) Y dimension failure, D1 display (P0) = 01B5C. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 2, during the N-SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 2.

<u>A0</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55 G56 and H51

(14) Y dimension failure, D1 display (P0) = 01C00. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 1, unit 2, during the N-SEL ones test. Perform the following steps:

Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.

Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 2.

<u>A0</u>	<u>Replace Cards</u>
80XX	ABC40
40XX	ABC40
20XX	ABC38
10XX	ABC38
08XX	ABC36
04XX	ABC36
02XX	ABC34
01XX	ABC34
Any Other Value	D51, D52, D53, D54 and D55

(15) Y dimension failure, D1 display (P0) = 01BE0. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 2, during the N-SEL ones test. Perform the following steps:

Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.

Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 2.

<u>A0</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46
02XX	ABC44
01XX	ABC44
Any Other Value	D51, C53, C54, C55 and C56

(16) Y dimension failure, D1 display (P0) = 01BFC. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 1, unit 2, during the N-SEL ones test. Perform the following steps:

Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.

Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG40
40XX	EFG40
20XX	EFG38
10XX	EFG38
08XX	EFG36
04XX	EFG36
02XX	EFG34
01XX	EFG34
Any Other Value	H51, H52, H53, H54 and H55

(17) Y dimension failure, D1 display (PØ) = 01BEC. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 1, during the N-SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55, G56 and H51

(18) Y dimension failure, D1 display (PØ) = 01BF0. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 1, during the N-SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>AØ</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46

<u>AØ</u>	<u>Replace Cards</u>
02XX	ABC44
01XX	ABC44
Any Other Value	D51, C53, C54, C55 and C56

(19) Y dimension failure, D1 display (PØ) = 01BDC. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 2, during the N-SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55, G56 and H51

(20) Y dimension failure, D1 display (PØ) = 01CD6. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 1, unit 2, during the SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	ABC40
40XX	ABC40
20XX	ABC38
10XX	ABC38
08XX	ABC36
04XX	ABC36
02XX	ABC34
01XX	ABC34
Any Other Value	D51, D52, D53, D54 and D55

(21) Y dimension failure, D1 display (P0) = 01CC6. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 1, during the SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 1.

<u>A0</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46
02XX	ABC44
01XX	ABC44
Any Other Value	D51, C53, C54, C55 and C56

(22) Y dimension failure, D1 display (P0) = 01CD2. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 1, unit 2, during the SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 value listed below and replace specified cards on memory chassis of Unit 2.

<u>A0</u>	<u>Replace Cards</u>
80XX	EFG40
40XX	EFG40
20XX	EFG38
10XX	EFG38
08XX	EFG36
04XX	EFG36
02XX	EFG34
01XX	EFG34
Any Other Value	H51, H52, H53, H54 and H55

(23) Y dimension failure, D1 display (P0) = 01CC2. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 1, during the SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe A0 REGISTER indicators.
- Step 2. Locate corresponding A0 values listed below and replace specified cards on memory chassis of Unit 1.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55, G56 and H51

(24) Y dimension failure, D1 display (PØ) = 01CB6. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 2, during the SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46
02XX	ABC44
01XX	ABC44
Any Other Value	D51, C53, C54, C55 and C56

(25) Y dimension failure, D1 display (PØ) = 01CB2. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 2, during the SEL zeros test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ values listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46

<u>AØ</u>	<u>Replace Cards</u>
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55, G56 and H51

(26) Y dimension failure, D1 display (PØ) = 01D1E. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 1, unit 2, during the U/L SEL test for zeros. Replace card D51 on memory chassis of Unit 2.

(27) Y dimension failure, D1 display (PØ) = 01DOE. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 1, during the U/L SEL test for zeros. Replace card D51 on memory chassis of Unit 1.

(28) Y dimension failure, D1 display (PØ) = 01D1A. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 1, unit 2, during the U/L SEL test for zeros. Replace card H51 on memory chassis of Unit 2.

(29) Y dimension failure, D1 display (PØ) = 01DOA. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 1, during the U/L SEL test for zeros. Replace card H51 on memory chassis of Unit 1.

(30) Y dimension failure, D1 display (PØ) = 01CFE. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 2, during the U/L SEL test for zeros. Replace card D51 on memory chassis of Unit 2.

(31) Y dimension failure, D1 display (PØ) = 01CFA. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 2, during the U/L SEL test for zeros. Replace card H51 on memory chassis of Unit 2.

(32) Y dimension failure, D1 display (PØ) = 01DF4. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 1, unit 2, during the SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	ABC40
40XX	ABC40
20XX	ABC38
10XX	ABC38
08XX	ABC36
04XX	ABC36
02XX	ABC34
01XX	ABC34
Any Other Value	D51, D52, D53, D54 and D55

(33) Y dimension failure, D1 display (PØ) = 01DE4. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 1, during the SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>AØ</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46
02XX	ABC44
01XX	ABC44
Any Other Value	C53, C54, C55, C56 and D51

(34) Y dimension failure, D1 display (PØ) = 01DF0. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 1, unit 2, during the SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG40
40XX	EFG40
20XX	EFG38
10XX	EFG38
08XX	EFG36
04XX	EFG36
02XX	EFG34
01XX	EFG34
Any Other Value	H51, H52, H53, H54 and H55

(35) Y dimension failure, D1 display (PØ) = 01DE0. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 1, during the SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55, G56 and H51

(36) Y dimension failure, D1 display (PØ) = 01DD4. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 2, during the SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	ABC50
40XX	ABC50
20XX	ABC48
10XX	ABC48
08XX	ABC46
04XX	ABC46
02XX	ABC44
01XX	ABC44
Any Other Value	C53, C54, C55, C56 and D51

(37) Y dimension failure, D1 display (PØ) = 01DD0. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 2, during the SEL ones test. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>AØ</u>	<u>Replace Cards</u>
80XX	EFG50
40XX	EFG50
20XX	EFG48
10XX	EFG48
08XX	EFG46
04XX	EFG46

<u>AØ</u>	<u>Replace Cards</u>
02XX	EFG44
01XX	EFG44
Any Other Value	G53, G54, G55, G56 and H51

(38) Y dimension failure, D1 display (PØ) = 01E3C. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 1, unit 2, during the U/L SEL test for ones. Replace card D51 on memory chassis of Unit 2.

(39) Y dimension failure, D1 display (PØ) = 01E2C. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 1, during the U/L SEL test for ones. Replace card D51 on memory chassis of Unit 1.

(40) Y dimension failure, D1 display (PØ) = 01E38. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 1, unit 2, during the U/L SEL test for ones. Replace card H51 on memory chassis of Unit 2.

(41) Y dimension failure, D1 display (PØ) = 01E28. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 1, during the U/L SEL test for ones. Replace card H51 on memory chassis of Unit 1.

(42) Y dimension failure, D1 display (PØ) = 01E1C. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 0, stack 2, unit 2, during the U/L SEL test for ones. Replace card D51 on memory chassis of Unit 2.

(43) Y dimension failure, D1 display (PØ) = 01E18. - Referral to this paragraph indicates a malfunction occurred in the Y dimension circuitry of byte 1, stack 2, unit 2, during the U/L SEL test for ones. Replace card H51 on memory chassis of Unit 2.

(44) X dimension error stop, D1 display (PØ) = 01EDE. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 1, stack 2, unit 2. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and refer to specified paragraph.

<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00010	4-3a(44)(a)	4-64
00020	4-3a(44)(b)	4-64
00040	4-3a(44)(c)	4-64
00070	4-3a(44)(d)	4-65
00080	4-3a(44)(e)	4-65
001C0	4-3a(44)(f)	4-66
00200	4-3a(44)(g)	4-67
00380	4-3a(44)(h)	4-67
003F0	4-3a(44)(i)	4-67
00400	4-3a(44)(j)	4-67

(a) AØ register = 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-18, page 4-102, and replace specified card(s) on memory chassis of Unit 2.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in the memory stack for byte 1, stack 2, unit 2. Replace appropriate 16K memory stack (P/N 4102975).

(c) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
8001	F13
8021	F13
8041	F13
8061	F13
8081	F13
80A1	F13
80C1	F13
80E1	F13
A001	F11
A021	F11
A041	F11
A061	F11
A081	F11
AOA1	F11
AOC1	F11
AOE1	F11

(d) AØ register = 00070. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and perform specified action.

<u>DØ</u>	<u>Action Required*</u>
8801	Replace card E06
9001	Replace card G08
9801	Replace card G06
C001	Replace card E12
C801	Replace card E10
D001	Replace card G12
D801	Replace card G10
Any Other Value	Record value and refer to paragraph 4-3a(52), page 4-102

(e) AØ register = 00080. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector, X sink octal translator, or word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
8001	F11, F13, E04 and D02
8021	F11 and F13
8041	F11 and F13
8061	F11 and F13
8081	F11 and F13

*All cards are on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
80A1	F11 and F13
80C1	F11 and F13
80E1	F11 and F13
8101	E04 and D02
8201	E04 and D02
8301	E04 and D02
8401	E04 and D02
8501	E04 and D02
8601	E04 and D02
8701	E04 and D02

(f) AØ register = 001C0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
8001	F13
8021	F13
8041	F13
8061	F13
8081	F13
80A1	F13
80C1	F13
80E1	F13
A001	F11
A021	F11
A041	F11
A061	F11
A081	F11
A0A1	F11
A0C1	F11
A0E1	F11

(g) AØ register = 00200. - Referral to this paragraph indicates a malfunction occurred in the word selector circuitry. Replace cards F04 and F06 on memory chassis of Unit 2.

(h) AØ register = 00380. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator circuitry. Replace cards D01, D02 and E04 on memory chassis of Unit 2.

(i) AØ register = 003F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed in Table 4-18, page 4-102, and replace specified card on memory chassis of Unit 2.

(j) AØ register = 00400. - Referral to this paragraph indicates a malfunction occurred in either the word current generator or word driver circuitry. Replace cards B13, B11 and B09 on memory chassis of Unit 2.

(45) X dimension error stop, D1 display (PØ) = 01EE2. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 0, stack 2, unit 2. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Find corresponding AØ value listed below and refer to specified paragraph.

<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00010	4-3a(45)(a)	4-67
00020	4-3a(45)(b)	4-68
00040	4-3a(45)(c)	4-68
00070	4-3a(45)(d)	4-68
00080	4-3a(45)(e)	4-69
001C0	4-3a(45)(f)	4-70
00200	4-3a(45)(g)	4-70
00380	4-3a(45)(h)	4-71
003F0	4-3a(45)(i)	4-71
00400	4-3a(45)(j)	4-71

(a) AØ register = 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.

- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-16, page 4-100, and replace specified card(s) on memory chassis of Unit 2.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in the memory stack for byte 0, stack 2, unit 2. Replace appropriate 16K memory stack (P/N 4102975).

(c) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
8000	B13
8020	B13
8040	B13
8060	B13
8080	B13
80A0	B13
80C0	B13
80E0	B13
A000	B11
A020	B11
A040	B11
A060	B11
A080	B11
AOA0	B11
AOCO	B11
AOEO	B11

(d) AØ register = 00070. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value below and perform specified operation.

<u>DØ</u>	<u>Action Required*</u>
8800	Replace card A06
9000	Replace card C08
9800	Replace card C06
C000	Replace card A12
C800	Replace card A10
D000	Replace card C12
D800	Replace card C10
Any Other Value	Record value and refer to paragraph 4-3a(53), page 4-106

(e) AØ register = 00080. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector, X sink octal translator, or word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
8000	B11, B13, A04 and D02
8020	B11 and B13
8040	B11 and B13
8060	B11 and B13
8080	B11 and B13
80A0	B11 and B13
80C0	B11 and B13
80E0	B11 and B13

*All cards are on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
8100	A04 and D02
8200	A04 and D02
8300	A04 and D02
8400	A04 and D02
8500	A04 and D02
8600	A04 and D02
8700	A04 and D02

(f) AØ register = 001C0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
8000	B13
8020	B13
8040	B13
8060	B13
8080	B13
80A0	B13
80C0	B13
80E0	B13
A000	B11
A020	B11
A040	B11
A060	B11
A080	B11
A0A0	B11
A0C0	B11
A0E0	B11

(g) AØ register = 00200. - Referral to this paragraph indicates a malfunction occurred in the word driver selector circuitry. Replace cards B06 and F04 on memory chassis of Unit 2.

(h) AØ register = 00380. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator circuitry. Replace cards A04, D01 and D02 on memory chassis of Unit 2.

(i) AØ register = 003F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed in Table 4-16, page 4-100, and replace specified card on memory chassis of Unit 2.

(j) AØ register = 00400. - Referral to this paragraph indicates a malfunction occurred in the word current generator or word driver circuitry. Replace cards B13, B11 and B09 on memory chassis of Unit 2.

(46) X dimension error stop, D1 display (PØ) = 01EF6. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 1, stack 2, unit 1. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below for the appropriate memory size and refer to specified paragraph.

<u>48K Memory Only</u>			<u>All Other Memory Sizes</u>		
<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>	<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00010	4-3a(46)(a)	4-71	00010	4-3a(46)(a)	4-71
00020	4-3a(46)(k)	4-75	00020	4-3a(46)(b)	4-72
00030	4-3a(46)(d)	4-72	00040	4-3a(46)(c)	4-72
00040	4-3a(46)(e)	4-73	00070	4-3a(46)(d)	4-72
00070	4-3a(46)(d)	4-72	00080	4-3a(46)(e)	4-73
00080	4-3a(46)(l)	4-76	001C0	4-3a(46)(f)	4-74
00100	4-3a(46)(g)	4-74	00200	4-3a(46)(g)	4-74
001C0	4-3a(46)(h)	4-75	00380	4-3a(46)(h)	4-75
00180	4-3a(46)(h)	4-75	003F0	4-3a(46)(i)	4-75
001F0	4-3a(46)(m)	4-76	00400	4-3a(46)(j)	4-75
00200	4-3a(46)(j)	4-75			

(a) AØ register = 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.

- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding AØ value in Table 4-18, page 4-102, and replace specified card(s) on memory chassis of Unit 1.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in the memory stack for byte 1, stack 2, unit 1. Replace appropriate 16K memory stack (P/N 4102975).

(c) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
8001	F13
8021	F13
8041	F13
8061	F13
8081	F13
80A1	F13
80C1	F13
80E1	F13
A001	F11
A021	F11
A041	F11
A061	F11
A081	F11
AOA1	F11
AOC1	F11
AOE1	F11

(d) AØ register = 00070 or 00030. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value below and perform specified operation.

<u>DØ</u>	<u>Action Required*</u>
8801	Replace card E06
9001	Replace card G08
9801	Replace card G06
C001	Replace card E12
C801	Replace card E10
D001	Replace card G12
D801	Replace card G10
Any Other Value	Record value and refer to paragraph 4-3a(52), page 4-102

(e) AØ register = 00080 or 00040 (48K memory only). - Referral to this paragraph indicates a malfunction occurred in either the X sink selector, X sink octal translator, or word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
8001	F11, F13, E04 and D02
8021	F11 and F13
8041	F11 and F13
8061	F11 and F13
8081	F11 and F13
80A1	F11 and F13
80C1	F11 and F13
80E1	F11 and F13

*All cards are on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
8101	E04 and D02
8201	E04 and D02
8301	E04 and D02
8401	E04 and D02
8501	E04 and D02
8601	E04 and D02
8701	E04 and D02

(f) AØ register = 001C0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
8001	F13
8021	F13
8041	F13
8061	F13
8081	F13
80A1	F13
80C1	F13
80E1	F13
A001	F11
A021	F11
A041	F11
A061	F11
A081	F11
AOA1	F11
AOC1	F11
AOE1	F11

(g) AØ register = 00200 or 00100 (48K memory only). - Referral to this paragraph indicates a malfunction occurred in the word selector circuitry. Replace cards F04 and F06 on memory chassis of Unit 1.

(h) AØ register = 00380 or 001C0 (48K memory only), or 00180 (48K memory only). - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator circuitry. Replace cards E04, D01, and D02 on memory chassis of Unit 1.

(i) AØ register = 003F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 0072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed in Table 4-18, page 4-102, and replace specified card on memory chassis of Unit 1.

(j) AØ register = 00400 or 00200 (48K memory only). - Referral to this paragraph indicates a malfunction occurred in the word current generator or word driver circuits. Replace cards B13, B11 and B09 on memory chassis of Unit 1.

(k) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in either the word driver circuitry or memory stack. Perform the following steps to determine the defective word driver card. If replacement of the word driver card does not correct the malfunction replace the 16K memory stack for byte 1, stack 2, unit 1 (P/N 4102975).

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
8001	F13
8021	F13
8041	F13
8061	F13
8081	F13
80A1	F13
80C1	F13
80E1	F13
A001	F11

<u>DØ</u>	<u>Replace Card</u>
A021	F11
A041	F11
A061	F11
A081	F11
AOA1	F11
AOC1	F11
AOE1	F11

(1) AØ register = 00080. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
8001	E04 and D02
8101	E04 and D02
8201	E04 and D02
8301	E04 and D02
8401	E04 and D02
8501	E04 and D02
8601	E04 and D02
8701	E04 and D02

(m) AØ register = 001F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-18, page 4-102, and replace specified card(s) on memory chassis of Unit 1.

(47) X dimension error stop, D1 display (PØ) = 01EFA. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 0, stack 2, unit 1. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Find corresponding AØ value listed below for the appropriate memory size and refer to specified paragraph.

48K Memory Size			All Other Memory Sizes		
<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>	<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00010	4-3a(47)(a)	4-77	00010	4-3a(47)(a)	4-77
00020	4-3a(47)(k)	4-81	00020	4-3a(47)(b)	4-77
00030	4-3a(47)(d)	4-78	00040	4-3a(47)(c)	4-77
00040	4-3a(47)(e)	4-79	00070	4-3a(47)(d)	4-78
00070	4-3a(47)(d)	4-78	00080	4-3a(47)(e)	4-79
00080	4-3a(47)(l)	4-81	001C0	4-3a(47)(f)	4-79
00100	4-3a(47)(g)	4-80	00200	4-3a(47)(g)	4-80
001C0	4-3a(47)(h)	4-80	00380	4-3a(47)(h)	4-80
00180	4-3a(47)(h)	4-80	003F0	4-3a(47)(i)	4-80
001F0	4-3a(47)(m)	4-82	00400	4-3a(28)(j)	4-80
00200	4-3a(47)(j)	4-80			

(a) AØ register = 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-16, page 4-100, and replace specified card(s) on memory chassis of Unit 1.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in the memory stack for byte 0, stack 2, unit 1. Replace appropriate 16K memory stack (P/N 4102975).

(c) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.

- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
8000	B13
8020	B13
8040	B13
8060	B13
8080	B13
80A0	B13
80C0	B13
80E0	B13
A000	B11
A020	B11
A040	B11
A060	B11
A080	B11
A0A0	B11
A0C0	B11
A0E0	B11

(d) AØ register = 00070. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value below and perform specified action.

<u>DØ</u>	<u>Action Required*</u>
8800	Replace card A06
9000	Replace card C08
9800	Replace card C06
C000	Replace card A12
C800	Replace card A10
D000	Replace card C12

*All cards are on memory chassis of Unit 1.

<u>DØ</u>	<u>Action Required*</u>
D800	Replace card C10
Any Other Value	Record value and refer to paragraph 4-3a(53), page 4-106

(e) AØ register = 00080. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector, X sink octal translator, or word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card(s) on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
8000	B11, B13, A04 and D02
8020	B11 and B13
8040	B11 and B13
8060	B11 and B13
8080	B11 and B13
80A0	B11 and B13
80C0	B11 and B13
80E0	B11 and B13
8100	A04 and D02
8200	A04 and D02
8300	A04 and D02
8400	A04 and D02
8500	A04 and D02
8600	A04 and D02
8700	A04 and D02

(f) AØ register = 001C0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.

* Card is on memory chassis of Unit 1.

Step 6. At C display, observe DØ REGISTER indicators.

Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
8000	B13
8020	B13
8040	B13
8060	B13
8080	B13
80A0	B13
80C0	B13
80E0	B13
A000	B11
A020	B11
A040	B11
A060	B11
A080	B11
A0A0	B11
A0C0	B11
A0E0	B11

(g) AØ register = 00200. - Referral to this paragraph indicates a malfunction occurred in the word driver selector circuitry. Replace cards B06 and F04 on memory chassis of Unit 1.

(h) AØ register = 00380, 001C0 or 00180. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator circuitry. Replace cards A04, D01 and D02 on memory chassis of Unit 1.

(i) AØ register = 003F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

Step 1. Position rotary switch D at 1.

Step 2. Position rotary switch C at 2.

Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.

Step 4. Press MAINTENANCE READ switch to active position.

Step 5. Press RUN switch.

Step 6. At C display, observe DØ REGISTER indicators.

Step 7. Locate corresponding DØ value listed in Table 4-16, page 4-100, and replace specified card on memory chassis of Unit 1.

(j) AØ register = 00400. - Referral to this paragraph indicates a malfunction occurred in the word current generator or word driver circuitry. Replace cards B13, B11 and B09 on memory chassis of Unit 1.

(k) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in either the word driver circuitry or memory stack. Perform the following steps to determine the defective word driver card. If replacement of the word driver card does not correct the malfunction, replace the 16K memory stack for byte 0, stack 2, unit 1 (P/N 4102975).

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
8000	B13
8020	B13
8040	B13
8060	B13
8080	B13
80A0	B13
80C0	B13
80E0	B13
A000	B11
A020	B11
A040	B11
A060	B11
A080	B11
AOA0	B11
AOCO	B11
AOEO	B11

(1) AØ register = 00080. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. - At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.

- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
8000	A04 and D02
8100	A04 and D02
8200	A04 and D02
8300	A04 and D02
8400	A04 and D02
8500	A04 and D02
8600	A04 and D02
8700	A04 and D02

(m) AØ register = 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-16, page 4-100, and replace specified card(s) on memory chassis of Unit 1.

(48) X dimension error stop, D1 display (PØ) = 01F06. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 1, stack 1, unit 2. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below and refer to specified paragraph.

<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00010	4-3a(48)(a)	4-83
00020	4-3a(48)(b)	4-83
00040	4-3a(48)(c)	4-83
00070	4-3a(48)(d)	4-84
00080	4-3a(48)(e)	4-84
001C0	4-3a(48)(f)	4-85
00200	4-3a(48)(g)	4-86
00380	4-3a(48)(h)	4-86
003F0	4-3a(48)(i)	4-86
00400	4-3a(48)(j)	4-86

(a) AØ register = 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-17, page 4-101, and replace specified card(s) on memory chassis of Unit 2.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in the memory stack for byte 1, stack 1, unit 2. Replace appropriate 16K memory stack (P/N 4102975).

(c) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
0001	F20
0021	F20
0041	F20
0061	F20
0081	F20
00A1	F20
00C1	F20
00E1	F20
2001	F18
2021	F18
2041	F18
2061	F18
2081	F18
20A1	F18
20C1	F18
20E1	F18

(d) AØ register = 00070. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value below and perform specified operation.

<u>DØ</u>	<u>Action Required*</u>
0801	Replace card E14
1001	Replace card G16
1801	Replace card G14
4001	Replace card E20
4801	Replace card E18
5001	Replace card G20~
5801	Replace card G18
Any Other Value	Record value and refer to paragraph 4-3a(54), page 4-100

(e) AØ register = 00080. - Referral to this paragraph indicates a malfunction occurred in either the X sink selectors, X sink octal translator, or word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
0001	F18, F20, G04, and D02
0021	F18 and F20
0041	F18 and F20
0061	F18 and F20
0081	F18 and F20
00A1	F18 and F20
00C1	F18 and F20

*All cards are on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
00E1	F18 and F20
0101	G04 and D02
0201	G04 and D02
0301	G04 and D02
0401	G04 and D02
0501	G04 and D02
0601	G04 and D02
0701	G04 and D02

(f) AØ register = 001C0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
0001	F20
0021	F20
0041	F20
0061	F20
0081	F20
00A1	F20
00C1	F20
00E1	F20
2001	F18
2021	F18
2041	F18
2061	F18
2081	F18
20A1	F18
20C1	F18
20E1	F18

(g) AØ register = 00200. - Referral to this paragraph indicates a malfunction occurred in the word driver selector circuitry. Replace cards B04 and F06 on memory chassis of Unit 2.

(h) AØ register = 00380. - Referral to this paragraph indicates a malfunction occurred in either the X sink selectors or X sink octal translator circuitry. Replace cards G04, D01 and D02 on memory chassis of Unit 2.

(i) AØ register = 003F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed in Table 4-17, page 4-101, and replace specified card on memory chassis of Unit 2.

(j) AØ register = 00400. - Referral to this paragraph indicates a malfunction occurred in either the word current generator or word driver circuitry. Replace cards B20, B18 and B16 on memory chassis of Unit 2.

(49) X dimension error stop, D1 display (PØ) = 01FOA. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 0, stack 1, unit 2. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Find corresponding AØ value listed below and refer to specified paragraph.

<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00010	4-3a(49)(a)	4-86
00020	4-3a(49)(b)	4-87
00040	4-3a(49)(c)	4-87
00070	4-3a(49)(d)	4-87
00080	4-3a(49)(e)	4-88
001C0	4-3a(49)(f)	4-89
00200	4-3a(49)(g)	4-89
00380	4-3a(49)(h)	4-90
003F0	4-3a(49)(i)	4-90
00400	4-3a(49)(j)	4-90

(a) AØ register = 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.

- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-15, page 4-100, and replace specified card(s) on memory chassis of Unit 2.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in the memory stack for byte 0, stack 1, unit 2. Replace appropriate 16K memory stack (P/N 4102975).

(c) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Set MAINTENANCE READ to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
0000	B20
0020	B20
0040	B20
0060	B20
0080	B20
00A0	B20
00C0	B20
00E0	B20
2000	B18
2020	B18
2040	B18
2060	B18
2080	B18
20A0	B18
20C0	B18
20E0	B18

(d) AØ register = 00070. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and perform specified operation.

<u>DØ</u>	<u>Action Required*</u>
0800	Replace card A14
1000	Replace card C16
1800	Replace card C14
4000	Replace card A20
4800	Replace card A18
5000	Replace card C20
5800	Replace card C18
Any Other Value	Record value and refer to paragraph 4-3a(55), page 4-114

(e) AØ register = 00080. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector, X sink octal translator, or word drivers. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cardson memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
0000	B18, B20, C04, and D02
0020	B18 and B20
0040	B18 and B20
0060	B18 and B20
Q080	B18 and B20
00A0	B18 and B20
00C0	B18 and B20
00E0	B18 and B20

*All cards are on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Cards</u>
0100	C04 and D02
0200	C04 and D02
0300	C04 and D02
0400	C04 and D02
0500	C04 and D02
0600	C04 and D02
0700	C04 and D02

(f) AØ register = 001C0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 2.

<u>DØ</u>	<u>Replace Card</u>
0000	B20
0020	B20
0040	B20
0060	B20
0080	B20
00A0	B20
00C0	B20
00E0	B20
2000	B18
2020	B18
2040	B18
2060	B18
2080	B18
20A0	B18
20C0	B18
20E0	B18

(g) AØ register = 00200. - Referral to this paragraph indicates a malfunction occurred in the word driver selector circuitry. Replace cards B04 and B06 on memory chassis of Unit 2.

(h) AØ register = 00380. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator circuitry. Replace cards C04, D01 and D02 on memory chassis of Unit 2.

(i) AØ register = 003F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed in Table 4-15, page 4-100, and replace specified card on memory chassis of Unit 2.

(j) AØ register = 00400. - Referral to this paragraph indicates a malfunction occurred in the word current generator or word driver circuitry. Replace cards B13, B16 and B20 on memory chassis of Unit 2.

(50) X dimension error stop, D1 display (PØ) = 01F16. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 1, stack 1, unit 1. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Locate corresponding AØ value listed below for the appropriate memory size and then refer to specified paragraph.

<u>24K Memory Size</u>			<u>All Other Memory Sizes</u>		
<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>	<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00008	4-3a(50)(a)	4-90	00010	4-3a(50)(a)	4-90
00018	4-3a(50)(c)	4-91	00020	4-3a(50)(b)	4-91
00020	4-3a(50)(j)	4-94	00030	4-3a(50)(c)	4-91
00038	4-3a(50)(c)	4-91	00040	4-3a(50)(d)	4-92
00040	4-3a(50)(k)	4-95	00070	4-3a(50)(c)	4-91
000C0	4-3a(50)(g)	4-94	00080	4-3a(50)(d)	4-92
000E0	4-3a(50)(g)	4-94	000E0	4-3a(50)(e)	4-93
000F0	4-3a(50)(h)	4-94	00100	4-3a(50)(f)	4-93
00100	4-3a(50)(i)	4-94	00180	4-3a(50)(g)	4-94
			001C0	4-3a(50)(g)	4-94
			001F0	4-3a(50)(h)	4-94
			00200	4-3a(50)(i)	4-94

(a) AØ register = 00008 or 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.

- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-17, page 4-101, and replace specified card(s) on memory chassis of Unit 1.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in either the word driver circuitry or memory stack. Perform the following steps to determine the defective word driver card. If replacement of the word driver card does not correct the malfunction, replace 16K memory stack for byte 1, stack 1, unit 1 (P/N 4102975).

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
00001	F20
00021	F20
00041	F20
00061	F20
00081	F20
000A1	F20
000C1	F20
000E1	F20
02001	F18
02021	F18
02041	F18
02061	F18
02081	F18
020A1	F18
020C1	F18
020E1	F18

(c) AØ register = 00070, 00030, 00018, or 00038. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and perform specified operation.

<u>DØ</u>	<u>Action Required*</u>
0801	Replace card E14
1001	Replace card G16
1801	Replace card G14
4001	Replace card E20
4801	Replace card E18
5001	Replace card G20
5801	Replace card G18
Any Other Value	Record value and refer to paragraph 4-3a(54), page 4-110

(d) AØ register = 00080 or 00040. - Referral to this paragraph indicates a malfunction occurred in either the X sink selectors, X sink octal translator, or word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
0001	F18, F20, G04 and D02
0021	F18 and F20
0041	F18 and F20
0061	F18 and F20
0081	F18 and F20
00A1	F18 and F20
00C1	F18 and F20
00E1	F18 and F20

*All cards are on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
0101	G04 and D02
0201	G04 and D02
0301	G04 and D02
0401	G04 and D02
0501	G04 and D02
0601	G04 and D02
0701	G04 and D02

(e) AØ register = 000E0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
00001	F20
00021	F20
00041	F20
00061	F20
00081	F20
000A1	F20
000C1	F20
000E1	F20
02001	F18
02021	F18
02041	F18
02061	F18
02081	F18
020A1	F18
020C1	F18
020E1	F18

(f) AØ register = 00100. - Referral to this paragraph indicates a malfunction occurred in the word driver selector circuitry. Replace cards B04 and F06 on memory chassis of Unit 1.

(g) AØ register = 000C0, 000E0, 00180, or 001C0. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator circuitry. Replace cards D01, D02 and G04 on memory chassis of Unit 1.

(h) AØ register = 001F0, or 000F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-17, page 4-101, and replace specified card(s) on memory chassis of Unit 1.

(i) AØ register = 00100 or 00200. - Referral to this paragraph indicates a malfunction occurred in either the word current generator or word driver circuitry. Replace cards B20, B18 and B16 on memory chassis of Unit 1.

(j) AØ = 00020. - Referral to this paragraph indicates a malfunction occurred in either the X sink selectors, word drivers, or memory stack. Perform the following steps to determine the defective X sink selector or word driver if replacement of the X sink selector and word driver cards does not correct the malfunction, replace the 16K memory stack for byte 1, stack 1, unit 1 (P/N 4102975).

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
0001	F18, F20, G04 and D02
0021	F18 and F20
0041	F18 and F20
0061	F18 and F20
0081	F18 and F20
00A1	F18 and F20
00C1	F18 and F20
00E1	F18 and F20
0101	G04 and D02
0201	G04 and D02

<u>DØ</u>	<u>Replace Cards</u>
0301	G04 and D02
0401	G04 and D02
0501	G04 and D02
0601	G04 and D02
0701	G04 and D02

(k) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Replace cards F18 and F20 on memory chassis of Unit 1.

(51) X dimension error stop, D1 display (PØ) = 01F1A. - Referral to this paragraph indicates a malfunction occurred in the X dimension circuitry of byte 0, stack 1, unit 1. Perform the following steps:

- Step 1. Position rotary switch D at 2 and observe AØ REGISTER indicators.
- Step 2. Find corresponding AØ value listed below for the appropriate memory size and then refer to specified paragraph.

<u>24K Memory Size</u>			<u>All Other Memory Sizes</u>		
<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>	<u>AØ</u>	<u>Refer to Paragraph</u>	<u>On Page</u>
00008	4-3a(51)(a)	4-95	00010	4-3a(51)(a)	4-95
00018	4-3a(51)(c)	4-96	00020	4-3a(51)(b)	4-96
00020	4-3a(51)(j)	4-99	00030	4-3a(51)(c)	4-96
00038	4-3a(51)(c)	4-96	00040	4-3a(51)(d)	4-97
00040	4-3a(51)(k)	4-100	00070	4-3a(51)(c)	4-96
000C0	4-3a(51)(g)	4-98	00080	4-3a(51)(d)	4-97
000E0	4-3a(51)(g)	4-98	000E0	4-3a(51)(e)	4-98
000F0	4-3a(51)(h)	4-98	00100	4-3a(51)(f)	4-98
00100	4-3a(51)(i)	4-99	00180	4-3a(51)(g)	4-98
			001C0	4-3a(51)(g)	4-98
			001F0	4-3a(51)(h)	4-98
			00200	4-3a(51)(i)	4-99

(a) AØ register = 00008 or 00010. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-15, page 4-100, and replace specified card(s) on memory chassis of Unit 1.

(b) AØ register = 00020. - Referral to this paragraph indicates a malfunction occurred in either the word driver circuitry or memory stack. Perform the following steps to determine the defective word driver card. If replacement of the word driver card does not correct the malfunction, replace 16K memory stack for byte 0, stack 1, unit 1 (P/N 4102975).

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Set MAINTENANCE READ to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
00000	B20
00020	B20
00040	B20
00060	B20
00080	B20
000A0	B20
000C0	B20
000E0	B20
02000	B18
02020	B18
02040	B18
02060	B18
02080	B18
020A0	B18
020C0	B18
020E0	B18

(c) AØ register = 00070, 00030, 00018, or 00038. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.

Step 6. At C display, observe DØ REGISTER indicators.

Step 7. Locate corresponding DØ value below and perform specified operation.

<u>DØ</u>	<u>Action Required*</u>
0800	Replace card A14
1000	Replace card C16
1800	Replace card C14
4000	Replace card A20
4800	Replace card A18
5000	Replace card C20
5800	Replace card C18
Any Other Value	Record value and refer to paragraph 4-3a(55), page 4-114

(d) AØ register = 00080 or 00040. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector, X sink octal translator, or word drivers. Perform the following steps:

Step 1. Position rotary switch D at 1.

Step 2. Position rotary switch C at 2.

Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.

Step 4. Press MAINTENANCE READ switch to active position.

Step 5. Press RUN switch.

Step 6. At C display, observe DØ REGISTER indicators.

Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
00000	B18, B20, C04 and D02
00020	B18 and B20
00040	B18 and B20
00060	B18 and B20
00080	B18 and B20
000A0	B18 and B20
000C0	B18 and B20
000E0	B18 and B20
00100	C04 and D02
00200	C04 and D02
00300	C04 and D02
00400	C04 and D02
00500	C04 and D02

*All cards are on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
00600	C04 and D02
00700	C04 and D02

(e) AØ register = 000E0. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified card on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Card</u>
00000	B20
00020	B20
00040	B20
00060	B20
00080	B20
000A0	B20
000C0	B20
000E0	B20
02000	B18
02020	B18
02040	B18
02060	B18
02080	B18
020A0	B18
020C0	B18
020E0	B18

(f) AØ register = 00100. - Referral to this paragraph indicates a malfunction occurred in the X sink selector circuitry. Replace cards B04 and B06 on memory chassis of Unit 1.

(g) AØ register = 000C0, 000E0, 00180, or 001C0. - Referral to this paragraph indicates a malfunction occurred in either the X sink selector or X sink octal translator circuitry. Replace cards C04, D01 and D02 on memory chassis of Unit 1.

(h) AØ register = 001F0 or 000F0. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry. Perform the following steps:

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00072.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value in Table 4-15, page 4-100, and replace specified card(s) on memory chassis of Unit 1.

(i) AØ register = 00200 or 00100. - Referral to this paragraph indicates a malfunction occurred in either the word current generator or word driver circuitry. Replace cards B16, N18 and B20 on memory chassis of Unit 1.

(j) AØ = 00020. - Referral to this paragraph indicates a malfunction occurred in either the X sink selectors, word drivers or memory stack. Perform the following steps to determine the defective X sink selector or word driver. If replacement of the X sink selector and word driver cards does not correct the malfunction, replace the 16K memory stack for byte 0, stack 1, unit 1 (P/N 4102975).

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 000A2.
- Step 4. Press MAINTENANCE READ switch to active position.
- Step 5. Press RUN switch.
- Step 6. At C display, observe DØ REGISTER indicators.
- Step 7. Locate corresponding DØ value listed below and replace specified cards on memory chassis of Unit 1.

<u>DØ</u>	<u>Replace Cards</u>
0000	B18, B20, C04 and D02
0020	B18 and B20
0040	B18 and B20
0060	B18 and B20
0080	B18 and B20
00A0	B18 and B20
00C0	B18 and B20
00E0	B18 and B20
0100	C04 and D02
0200	C04 and D02
0300	C04 and D02
0400	C04 and D02
0500	C04 and D02

<u>DØ</u>	<u>Replace Cards</u>
0600	C04 and D02
0700	C04 and D02

(k) AØ register = 00040. - Referral to this paragraph indicates a malfunction occurred in the word driver circuitry. Replace cards B18 and B20 on memory chassis of Unit 1.

Table 4-15. DØ Error Displays, Part 1

<u>DØ</u>	<u>REPLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>REPLACE CARD</u>
0000	A16	1000	C16	4000	A20	5000	C20
0100	A16	1100	C16	4100	A20	5100	C20
0200	A16	1200	C16	4200	A20	5200	C20
0300	A16	1300	C16	4300	A20	5300	C20
0400	A16	1400	C16	4400	A20	5400	C20
0500	A16	1500	C16	4500	A20	5500	C20
0600	A16	1600	C16	4600	A20	5600	C20
0700	A16	1700	C16	4700	A20	5700	C20
0800	A14	1800	C14	4800	A18	5800	C18
0900	A14	1900	C14	4900	A18	5900	C18
0A00	A14	1A00	C14	4A00	A18	5A00	C18
0B00	A14	1B00	C14	4B00	A18	5B00	C18
0C00	A14	1C00	C14	4C00	A18	5C00	C18
0D00	A14	1D00	C14	4D00	A18	5D00	C18
0E00	A14	1E00	C14	4E00	A18	5E00	C18
0F00	A14	1F00	C14	4F00	A18	5F00	C18

Table 4-16. DØ Error Displays, Part 2

<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLADE CARD</u>
8000	A08	8600	A08	8C00	A06	9200	C08
8100	A08	8700	A08	8D00	A06	9300	C08
8200	A08	8800	A06	8E00	A06	9400	C08
8300	A08	8900	A06	8F00	A06	9500	C08
8400	A08	8A00	A06	9000	C08	9600	C08
8500	A08	8B00	A06	9100	C08	9700	C08

Table 4-16. DØ Error Displays, Part 2 (continued)

<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>
9800	C06	C200	A12	CC00	A10	D600	C12
9900	C06	C300	A12	CD00	A10	D700	C12
9A00	C06	C400	A12	CE00	A10	D800	C10
9B00	C06	C500	A12	CF00	A10	D900	C10
9C00	C06	C600	A12	D000	C12	DA00	C10
9D00	C06	C700	A12	D100	C12	DB00	C10
9E00	C06	C800	A10	D200	C12	DC00	C10
9F00	C06	C900	A10	D300	C12	DD00	C10
C000	A12	CA00	A10	D400	C12	DE00	C10
C100	A12	CB00	A10	D500	C12	DF00	C10

Table 4-17. DØ Error Displays, Part 3

<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>
0001	E16	1001	G16	4001	E20	5001	G20
0101	E16	1101	G16	4101	E20	5101	G20
0201	E16	1201	G16	4201	E20	5201	G20
0301	E16	1301	G16	4301	E20	5301	G20
0401	E16	1401	G16	4401	E20	5401	G20
0501	E16	1501	G16	4501	E20	5501	G20
0601	E16	1601	G16	4601	E20	5601	G20
0701	E16	1701	G16	4701	E20	5701	G20
0801	E14	1801	G14	4801	E18	5801	G18
0901	E14	1901	G14	4901	E18	5901	G18
0A01	E14	1A01	G14	4A01	E18	5A01	G18
0B01	E14	1B01	G14	4B01	E18	5B01	G18
0C01	E14	1C01	G14	4C01	E18	5C01	G18
0D01	E14	1D01	G14	4D01	E18	5D01	G18
0E01	E14	1E01	G14	4E01	E18	5E01	G18
0F01	E14	1F01	G14	4F01	E18	5F01	G18

Table 4-18. DØ Error Displays, Part 4

<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>	<u>DØ</u>	<u>RE PLACE CARD</u>
8001	E08	9001	G08	C001	E12	D001	G12
8101	E08	9101	G08	C101	E12	D101	G12
8201	E08	9201	G08	C201	E12	D201	G12
8301	E08	9301	G08	C301	E12	D301	G12
8401	E08	9401	G08	C401	E12	D401	G12
8501	E08	9501	G08	C501	E12	D501	G12
8601	E08	9601	G08	C601	E12	D601	G12
8701	E08	9701	G08	C701	E12	D701	G12
8801	E06	9801	G06	C801	E10	D801	G10
8901	E06	9901	G06	C901	E10	D901	G10
8A01	E06	9A01	G06	CA01	E10	DA01	G10
8B01	E06	9B01	G06	CB01	E10	DB01	G10
8C01	E06	9C01	G06	CC01	E10	DC01	G10
8D01	E06	9D01	G06	CD01	E10	DD01	G10
8E01	E06	9E01	G06	CE01	E10	DE01	G10
8F01	E06	9F01	G06	CF01	E10	DF01	G10

(52) Manual Test, X sink double-select, part 1. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry in which half-word current was present due to the simultaneous selection of two X sinks.

NOTE

All switches and indicators referenced in this procedure are on the memory chassis maintenance panel. Also, cards specified for replacement may be on memory chassis of either unit, depending on referencing paragraph.

Step 1. Locate DØ value listed below and perform required action:

<u>DØ</u>	<u>Perform Steps</u>
8001	2, 3 and 4
8101	5, 6 and 7
8201	8, 9 and 10
8301	11, 12 and 13
8401	14, 15 and 16
8501	17, 18 and 19
8601	20, 21 and 22
8701	23, 24 and 25

- Step 2. Press TIMING CLR switch.
- Step 3. Press ADDRESS SA16 indicator-switch.
- Step 4. With a multimeter, test Item 1 in Table 4-19.
- Step 5. Press TIMING CLR switch.
- Step 6. Press ADDRESS SA16 and SA23 indicator-switches.
- Step 7. With a multimeter, test Item 8 in Table 4-19, page 4-104.
- Step 8. Press TIMING CLR switch.
- Step 9. Press ADDRESS SA16 and SA22 indicator-switches.
- Step 10. With a multimeter, test Item 15 in Table 4-19, page 4-104.
- Step 11. Press TIMING CLR switch.
- Step 12. Press ADDRESS SA16, SA22 and SA23 indicator-switches.
- Step 13. With a multimeter, test Item 22 in Table 4-19, page 4-104.
- Step 14. Press TIMING CLR switch.
- Step 15. Press ADDRESS SA16 and SA21 indicator-switches.
- Step 16. With a multimeter, test Item 29 in Table 4-19, page 4-105.
- Step 17. Press TIMING CLR switch.
- Step 18. Press ADDRESS SA16, SA21 and SA23 indicator-switches.
- Step 19. With a multimeter, test Item 36 in Table 4-19, page 4-105.
- Step 20. Press TIMING CLR switch.
- Step 21. Press ADDRESS SA16, SA21 and SA22 indicator-switches.
- Step 22. With a multimeter, test Item 43 in Table 4-19, page 4-105.
- Step 23. Press TIMING CLR switch.
- Step 24. Press ADDRESS SA16, SA21, SA22 and SA23 indicator-switches.
- Step 25. With a multimeter, test Item 50 in Table 4-19, page 4-106.

Table 4-19. X Sink Double-Select Test, Part 1

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS</u>
1	E06	2	If +12V test Item 2 If not +12V replace card E06
2	G08	2	If +12V test Item 3 If not +12V replace card G03
3	G06	2	If +12V test Item 4 If not +12V replace card G06
4	E12	2	If +12V test Item 5 If not +12V replace card E12
5	E10	2	If +12V test Item 6 If not +12V replace card E10

*+12 $\pm$ 2 volts dc

Table 4-19. X Sink Double-Select Test, Part 1 (continued)

ITEM	CARD LOCATION	TEST POINT	REMARKS*
6	G12	2	If +12V test Item 7 If not +12V replace card G12
7	G10	2	If +12V replace card E08 If not +12V replace card G10
8	E06	3	If +12V test Item 9 If not +12V replace card E06
9	G08	3	If +12V test Item 10 If not +12V replace card G08
10	G06	3	If +12V test Item 11 If not +12V replace card G06
11	E12	3	If +12V test Item 12 If not +12V replace card E12
12	E10	3	If +12V test Item 13 If not +12V replace card E10
13	G12	3	If +12V test Item 14 If not +12V replace card G12
14	G10	3	If +12V replace card E08 If not +12V replace card G10
15	E06	5	If +12V test Item 16 If not +12V replace card E06
16	G08	5	If +12V test Item 17 If not +12V replace card G08
17	G06	5	If +12V test Item 18 If not +12V replace card G06
18	E12	5	If +12V test Item 19 If not +12V replace card E12
19	E10	5	If +12V test Item 20 If not +12V replace card E10
20	G12	5	If +12V test Item 21 If not +12V replace card G12
21	G10	5	If +12V replace card E08 If not +12V replace card G10
22	E06	6	If +12V test Item 23 If not +12V replace card E06
23	G08	6	If +12V test Item 24 If not +12V replace card G08
24	G06	6	If +12V test Item 25 If not +12V replace card G06
25	E12	6	If +12V test Item 26 If not +12V replace card E12

*+12 +2 volts dc

Table 4-19. X Sink Double-Select Test, Part 1 (continued)

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
26	E10	6	If +12V test Item 27 If not +12V replace card E10
27	G12	6	If +12V test Item 28 If not +12V replace card G12
28	G10	6	If +12V replace card E08 If not +12V replace card G10
29	E06	9	If +12V test Item 30 If not +12V replace card E06
30	G08	9	If +12V test Item 31 If not +12V replace card G08
31	G06	9	If +12V test Item 32 If not +12V replace card G06
32	E12	9	If +12V test Item 33 If not +12V replace card E12
33	E10	9	If +12V test Item 34 If not +12V replace card E10
34	G12	9	If +12V test Item 35 If not +12V replace card G12
35	G10	9	If +12V replace card E08 If not +12V replace card G10
36	E06	10	If +12V test Item 37 If not +12V replace card E06
37	G08	10	If +12V test Item 38 If not +12V replace card G08
38	G06	10	If +12V test Item 39 If not +12V replace card G06
39	E12	10	If +12V test Item 40 If not +12V replace card E12
40	E12	10	If +12V test Item 41 If not +12V replace card E12
41	G12	10	If +12V test Item 42 If not +12V replace card G12
42	G10	10	If +12V replace card E08 If not +12V replace card G10
43	E06	12	If +12V test Item 44 If not +12V replace card E06
44	G08	12	If +12V test Item 45 If not +12V replace card G08
45	G06	12	If +12V test Item 46 If not +12V replace card G06

*+12 $\pm$ 2 volts dc

Table 4-19. X Sink Double-Select Test, Part 1 (continued)

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
46	E12	12	If +12V test Item 47 If not +12V replace card E12
47	E10	12	If +12V test Item 48 If not +12V replace card E10
48	G12	12	If +12V test Item 49 If not +12V replace card G12
49	G10	12	If +12V replace card E08 If not +12V replace card G10
50	E06	15	If +12V test Item 51 If not +12V replace card E06
51	G08	15	If +12V test Item 52 If not +12V replace card G08
52	G06	15	If +12V test Item 53 If not +12V replace card G06
53	E12	15	If +12V test Item 54 If not +12V replace card E12
54	E10	15	If +12V test Item 55 If not +12V replace card E10
55	G12	15	If +12V test Item 56 If not +12V replace card G12
56	G10	15	If +12V replace card E08 If not +12V replace card G10

(53) Manual Test, X sink double-select, part 2. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry in which half-word current was present due to the simultaneous selection of two X sinks.

NOTE

All switches and indicators referenced in this procedure are on the memory chassis maintenance panel. Also, cards specified for replacement may be on memory chassis of either unit, depending on referencing paragraph.

Step 1. Local DØ value listed below and perform required action:

<u>DØ</u>	<u>Perform Steps</u>
8000	2, 3 and 4
8100	5, 6 and 7
8200	8, 9 and 10
8300	11, 12 and 13
8400	14, 15 and 16
8500	17, 18 and 19
8600	20, 21 and 22
8700	23, 24 and 25

*+12 +2 volts dc

- Step 2. Press TIMING CLR switch.
- Step 3. Press ADDRESS SA16 indicator-switch.
- Step 4. With a multimeter, test Item 1 in Table 4-20.
- Step 5. Press TIMING CLR switch.
- Step 6. Press ADDRESS SA16 and SA23 indicator-switches.
- Step 7. With a multimeter, test Item 8 in Table 4-20, page 4-108.
- Step 8. Press TIMING CLR switch.
- Step 9. Press ADDRESS SA16 and SA22 indicator-switches.
- Step 10. With a multimeter, test Item 15 in Table 4-20, page 4-108.
- Step 11. Press TIMING CLR switch.
- Step 12. Press ADDRESS SA16, SA22 and SA23 indicator-switches.
- Step 13. With a multimeter, test Item 22 in Table 4-20, page 4-108.
- Step 14. Press TIMING CLR switch.
- Step 15. Press ADDRESS SA16 and SA21 indicator-switches.
- Step 16. With a multimeter, test Item 29 in Table 4-20, page 4-109.
- Step 17. Press TIMING CLR switch.
- Step 18. Press ADDRESS SA16, SA21 and SA23 indicator-switches.
- Step 19. With a multimeter, test Item 36 in Table 4-20, page 4-109.
- Step 20. Press TIMING CLR switch.
- Step 21. Press ADDRESS SA16, SA21, and SA22 indicator-switches.
- Step 22. With a multimeter, test Item 43 in Table 4-20, page 4-109.
- Step 23. Press TIMING CLR switch.
- Step 24. Press ADDRESS SA16, SA21, SA22 and SA23 indicator-switches.
- Step 25. With a multimeter, test Item 50 in Table 4-20, page 4-110.

Table 4-20. X Sink Double-Select Test, Part 2

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
1	A06	2	If +12V test Item 2 If not +12V replace card A06
2	C08	2	If +12V test Item 3 If not +12V replace card C08
3	C06	2	If +12V test Item 4 If not +12V replace card C06
4	A12	2	If +12V test Item 5 If not +12V replace card A12
5	A10	2	If +12V test Item 6 If not +12V replace card A10

*+12 $\pm$ 2 volts dc

Table 4-20. X Sink Double-Select Test, Part 2 (continued)

ITEM	CARD LOCATION	TEST POINT	REMARKS*
6	C12	2	If +12V test Item 7 If not +12V replace card C12
7	C10	2	If +12V replace card A08 If not +12V replace card C10
8	A06	3	If +12V test Item 9 If not +12V replace card A06
9	C08	3	If +12V test Item 10 If not +12V replace card C08
10	C06	3	If +12V test Item 11 If not +12V replace card C06
11	A12	3	If +12V test Item 12 If not +12V replace card A12
12	A10	3	If +12V test Item 13 If not +12V replace card A10
13	C12	3	If +12V test Item 14 If not +12V replace card C12
14	C10	3	If +12V replace card A08 If not +12V replace card C10
15	A06	5	If +12V test Item 16 If not +12V replace card A06
16	C08	5	If +12V test Item 17 If not +12V replace card C08
17	C06	5	If +12V test Item 18 If not +12V replace card C06
18	A12	5	If +12V test Item 19 If not +12V replace card A12
19	A10	5	If +12V test Item 20 If not +12V replace card A10
20	C12	5	If +12V test Item 21 If not +12V replace card C12
21	C10	5	If +12V replace card A08 If not +12V replace card C10
22	A06	6	If +12V test Item 23 If not +12V replace card A06
23	C08	6	If +12V test Item 24 If not +12V replace card C08
24	C06	6	If +12V test Item 25 If not +12V replace card C06
25	A12	6	If +12V test Item 26 If not +12V replace card A12
26	A10	6	If +12V test Item 27 If not +12V replace card A10

*+12 $\pm$ 2 volts dc

Table 4-20. X Sink Double-Select Test, Part 2 (continued)

ITEM	CARD LOCATION	TEST POINT	REMARKS*
27	C12	6	If +12V test Item 28 If not +12V replace card C12
28	C10	6	If +12V replace card A08 If not +12V replace card C10
29	A06	9	If +12V test Item 30 If not +12V replace card A06
30	C08	9	If +12V test Item 31 If not +12V replace card C08
31	C06	9	If +12V test Item 32 If not +12V replace card C06
32	A12	9	If +12V test Item 33 If not +12V replace card A12
33	A10	9	If +12V test Item 34 If not +12V replace card A10
34	C12	9	If +12V test Item 35 If not +12V replace card C12
35	C10	9	If +12V replace card A08 If not +12V replace card C10
36	A06	10	If +12V test Item 37 If not +12V replace card A06
37	C08	10	If +12V test Item 38 If not +12V replace card C08
38	C06	10	If +12V test Item 39 If not +12V replace card C06
39	A12	10	If +12V test Item 40 If not +12V replace card A12
40	A10	10	If +12V test Item 41 If not +12V replace card A10
41	C12	10	If +12V test Item 42 If not +12V replace card C12
42	C10	10	If +12V replace card A10 If not +12V replace card C10
43	A06	12	If +12V test Item 44 If not +12V replace card A06
44	C08	12	If +12V test Item 45 If not +12V replace card C08
45	C06	12	If +12V test Item 46 If not +12V replace card C06
46	A12	12	If +12V test Item 47 If not +12V replace card A12

*+12 $\pm$ 2 volts dc

Table 4-20. X Sink Double-Select Test, Part 2 (continued)

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
47	A10	12	If +12V test Item 48 If not +12V replace card A10
48	C12	12	If +12V test Item 49 If not +12V replace card C12
49	C10	12	If +12V replace card A10 If not +12V replace card C10
50	A06	15	If +12V test Item 51 If not +12V replace card A06
51	C08	15	If +12V test Item 52 If not +12V replace card C08
52	C06	15	If +12V test Item 53 If not +12V replace card C06
53	A12	15	If +12V test Item 54 If not +12V replace card A12
54	A10	15	If +12V test Item 55 If not +12V replace card A10
55	C12	15	If +12V test Item 56 If not +12V replace card C12
56	C10	15	If +12V replace card A08 If not +12V replace card C10

(54) Manual test, X sink double-select, part 3. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry in which half-word current was present due to the simultaneous selection of two X sinks.

NOTE

All switches and indicators referenced in this procedure are on the memory chassis maintenance panel. Also, cards specified for replacement may be on memory chassis of either unit, depending on referencing paragraph.

Step 1. Locate DØ value listed below and perform required action:

<u>DØ</u>	<u>Perform Steps</u>
0001	2 and 3
0101	4, 5 and 6
0201	7, 8 and 9
0301	10, 11 and 12
0401	13, 14 and 15
0501	16, 17 and 18
0601	19, 20 and 21
0701	22, 23 and 24

Step 2. Press TIMING CLR switch.

Step 3. With a multimeter, test Item 1 in Table 4-21, page 4-111.

Step 4. Press TIMING CLR switch.

*+12 +2 volts dc

- Step 5. Press ADDRESS SA23 indicator-switch.
- Step 6. With a multimeter, test Item 8 in Table 4-21.
- Step 7. Press TIMING CLR switch.
- Step 8. Press ADDRESS SA22 indicator-switch.
- Step 9. With a multimeter, test Item 15 in Table 4-21, page 4-112.
- Step 10. Press TIMING CLR switch.
- Step 11. Press ADDRESS SA22 and SA23 indicator-switches.
- Step 12. With a multimeter, test Item 22 in Table 4-21, page 4-112.
- Step 13. Press TIMING CLR switch.
- Step 14. Press ADDRESS SA24 indicator-switch.
- Step 15. With a multimeter, test Item 29 in Table 4-21, page 4-112.
- Step 16. Press TIMING CLR switch.
- Step 17. Press ADDRESS SA21 and SA23 indicator-switches.
- Step 18. With a multimeter, test Item 36 in Table 4-21, page 4-113.
- Step 19. Press TIMING CLR switch.
- Step 20. Press ADDRESS SA21 and SA22 indicator-switches.
- Step 21. With a multimeter, test Item 43 in Table 4-21, page 4-113.
- Step 22. Press TIMING CLR switch.
- Step 23. Press ADDRESS SA21, SA22 and SA23 indicator-switches.
- Step 24. With a multimeter, test Item 50 in Table 4-21, page 4-114.

Table 4-21. X Sink Double-Select Test, Part 3

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
1	E14	2	If +12V test Item 2 If not +12V replace card E14
2	G16	2	If +12V test Item 3 If not +12V replace card G16
3	G14	2	If +12V test Item 4 If not +12V replace card G14
4	E20	2	If +12V test Item 5 If not +12V replace card E20
5	E18	2	If +12V test Item 6 If not +12V replace card E18
6	G20	2	If +12V test Item 7 If not +12V replace card G20
7	G18	2	If +12V test Item 8 If not +12V replace card G18
8	E14	3	If +12V test Item 9 If not +12V replace card E14
9	G16	3	If +12V test Item 10 If not +12V replace card G16

*+12 $\pm$ 2 volts dc

Table 4-21. X Sink Double-Select Test, Part 3 (continued)

ITEM	CARD LOCATION	TEST POINT	REMARKS*
10	G14	3	If +12V test Item 11 If not +12V replace card G14
11	E20	3	If +12V test Item 12 If not +12V replace card E20
12	E18	3	If +12V test Item 13 If not +12V replace card E18
13	G20	3	If +12V test Item 14 If not +12V replace card G20
14	G18	3	If +12V replace card E16 If not +12V replace card G18
15	E14	5	If +12V test Item 16 If not +12V replace card E14
16	G16	5	If +12V test Item 17 If not +12V replace card G16
17	G14	5	If +12V test Item 18 If not +12V replace card G14
18	E20	5	If +12V test Item 19 If not +12V replace card E20
19	E18	5	If +12V test Item 20 If not +12V replace card E18
20	G20	5	If +12V test Item 21 If not +12V replace card G20
21	G18	5	If +12V replace card E16 If not +12V replace card G18
22	E14	6	If +12V test Item 23 If not +12V replace card E14
23	G16	6	If +12V test Item 24 If not +12V replace card G16
24	G14	6	If +12V test Item 25 If not +12V replace card G14
25	E20	6	If +12V test Item 26 If not +12V replace card E20
26	E18	6	If +12V test Item 27 If not +12V replace card E18
27	G20	6	If +12V test Item 28 If not +12V replace card G20
28	G18	6	If +12V replace card E16 If not +12V replace card G18
29	E14	9	If +12V test Item 30 If not +12V replace card E14

*+12 $\pm$ 2 volts dc

Table 4-21. X Sink Double-Select Test, Part 3 (continued)

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
30	G16	9	If +12V test Item 31 If not +12V replace card G16
31	G14	9	If +12V test Item 32 If not +12V replace card G14
32	E20	9	If +12V test Item 33 If not +12V replace card E20
33	E18	9	If +12V test Item 34 If not +12V replace card E18
34	G20	9	If +12V test Item 35 If not +12V replace card G20
35	G18	9	If +12V replace card E16 If not +12V replace card G18
36	E14	10	If +12V test Item 37 If not +12V replace card E14
37	G16	10	If +12V test Item 38 If not +12V replace card G16
38	G14	10	If +12V test Item 39 If not +12V replace card G14
39	E20	10	If +12V test Item 40 If not +12V replace card E20
40	E18	10	If +12V test Item 41 If not +12V replace card E18
41	G20	10	If +12V test Item 42 If not +12V replace card G20
42	G18	10	If +12V replace card E16 If not +12V replace card G18
43	E14	12	If +12V test Item 44 If not +12V replace card E14
44	G16	12	If +12V test Item 45 If not +12V replace card G16
45	G14	12	If +12V test Item 46 If not +12V replace card G14
46	E20	12	If +12V test Item 47 If not +12V replace card E20
47	E18	12	If +12V test Item 48 If not +12V replace card E18
48	G20	12	If +12V test Item 49 If not +12V replace card G20
49	G18	12	If +12V replace card E16 If not +12V replace card G18

*+12 $\pm$ 2 volts dc

Table 4-21. X Sink Double-Select Test, Part 3 (continued)

ITEM	CARD LOCATION	TEST POINT	REMARKS*
50	E14	15	If +12V test Item 51 If not +12V replace card E14
51	G16	15	If +12V test Item 52 If not +12V replace card G16
52	G14	15	If +12V test Item 53 If not +12V replace card G14
53	E20	15	If +12V test Item 54 If not +12V replace card E20
54	E18	15	If +12V test Item 55 If not +12V replace card E18
55	G20	15	If +12V test Item 56 If not +12V replace card G20
56	G18	15	If +12V replace card E16 If not +12V replace card G18

(55) Manual test, X sink double-select, part 4. - Referral to this paragraph indicates a malfunction occurred in the X sink circuitry in which half-word current was present due to the simultaneous selection of two X sinks.

NOTE

All switches and indicators referenced in this procedure are on the memory chassis maintenance panel. Also, cards specified for replacement may be on memory chassis of either unit, depending on referencing paragraph.

Step 1. Locate DØ value listed below and perform required action:

<u>DØ</u>	<u>Perform Steps</u>
0000	2 and 3
0100	4, 5 and 6
0200	7, 8 and 9
0300	10, 11 and 12
0400	13, 14 and 15
0500	16, 17 and 18
0600	19, 20 and 21
0700	22, 23 and 24

Step 2. Press TIMING CLR switch.

Step 3. With a multimeter, test Item 1 in Table 4-22, page 4-116.

Step 4. Press TIMING CLR switch.

Step 5. Press ADDRESS SA23 indicator-switch.

Step 6. With a multimeter, test Item 8 in Table 4-22, page 4-116.

*+12 +2 volts dc

- Step 7. Press TIMING CLR switch.
- Step 8. Press ADDRESS SA22 indicator-switch.
- Step 9. With a multimeter, test Item 15 in Table 4-22, page 4-116.
- Step 10. Press TIMING CLR switch.
- Step 11. Press ADDRESS SA22 and SA23 indicator-switches.
- Step 12. With a multimeter, test Item 22 in Table 4-22, page 4-117.
- Step 13. Press TIMING CLR switch.
- Step 14. Press ADDRESS SA24 indicator-switch.
- Step 15. With a multimeter, test Item 29 in Table 4-22, page 4-117.
- Step 16. Press TIMING CLR switch.
- Step 17. Press ADDRESS SA21 and SA23 indicator-switches.
- Step 18. With a multimeter, test Item 36 in Table 4-22, page 4-117.
- Step 19. Press TIMING CLR switch.
- Step 20. Press ADDRESS SA21 and SA22 indicator-switches.
- Step 21. With a multimeter, test Item 43 in Table 4-22, page 4-118.
- Step 22. Press TIMING CLR switch.
- Step 23. Press ADDRESS SA21, SA22 and SA23 indicator-switches.
- Step 24. With a multimeter, test Item 50 in Table 4-22, page 4-118.

Table 4-22. X Sink Double-Select Test, Part 4

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
1	A14	2	If +12V test Item 2 If not +12V replace card A14
2	C16	2	If +12V test Item 3 If not +12V replace card C16
3	C14	2	If +12V test Item 4 If not +12V replace card C14
4	A20	2	If +12V test Item 5 If not +12V replace card A20
5	A18	2	If +12V test Item 6 If not +12V replace card A18
6	C20	2	If +12V test Item 7 If not +12V replace card C20
7	C18	2	If +12V replace card A16 If not +12V replace card C18
8	A14	3	If +12V test Item 9 If not +12V replace card A14
9	C16	3	If +12V test Item 10 If not +12V replace card C16
10	C14	3	If +12V test Item 11 If not +12V replace card C14
11	A20	3	If +12V test Item 12 If not +12V replace card A20
12	A18	3	If +12V test Item 13 If not +12V replace card A18
13	C20	3	If +12V test Item 14 If not +12V replace card C20
14	C18	3	If +12V replace card A16 If not +12V replace card C18
15	A14	5	If +12V test Item 16 If not +12V replace card A14
16	C16	5	If +12V test Item 17 If not +12V replace card C16
17	C14	5	If +12V test Item 18 If not +12V replace card C14
18	A20	5	If +12V test Item 19 If not +12V replace card A20

*+12 +2 volts dc

Table 4-22. X Sink Double-Select Test, Part 4 (continued)

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
19	A18	5	If +12V test Item 20 If not +12V replace card A18
20	C20	5	If +12V test Item 21 If not +12V replace card C20
21	C18	5	If +12V replace card A16 If not +12V replace card C18
22	A14	6	If +12V test Item 23 If not +12V replace card A14
23	C16	6	If +12V test Item 24 If not +12V replace card C16
24	C14	6	If +12V test Item 25 If not +12V replace card C14
25	A20	6	If +12V test Item 26 If not +12V replace card A20
26	A18	6	If +12V test Item 27 If not +12V replace card A18
27	C20	6	If +12V test Item 28 If not +12V replace card C20
28	C18	6	If +12V replace card A16 If not +12V replace card C18
29	A14	9	If +12V test Item 30 If not +12V replace card A14
30	C16	9	If +12V test Item 31 If not +12V replace card C16
31	C14	9	If +12V test Item 32 If not +12V replace card C14
32	A20	9	If +12V test Item 33 If not +12V replace card A20
33	A18	9	If +12V test Item 34 If not +12V replace card A18
34	C20	9	If +12V test Item 35 If not +12V replace card C20
35	C18	9	If +12V replace card A16 If not +12V replace card C18
36	A14	10	If +12V test Item 37 If not +12V replace card A14
37	C16	10	If +12V test Item 38 If not +12V replace card C16
38	C14	10	If +12V test Item 39 If not +12V replace card C14

*+12 $\pm$ 2 volts dc

Table 4-22. X Sink Double-Select Test, Part 4 (continued)

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
39	A20	10	If +12V test Item 40 If not +12V replace card A20
40	A18	10	If +12V test Item 41 If not +12V replace card A18
41	C20	10	If +12V test Item 42 If not +12V replace card C20
42	C18	10	If +12V replace card A16 If not +12V replace card C18
43	A14	12	If +12V test Item 44 If not +12V replace card A14
44	C16	12	If +12V test Item 45 If not +12V replace card C16
45	C14	12	If +12V test Item 46 If not +12V replace card C14
46	A20	12	If +12V test Item 47 If not +12V replace card A20
47	A18	12	If +12V test Item 48 If not +12V replace card A18
48	C20	12	If +12V test Item 49 If not +12V replace card C20
49	C18	12	If +12V replace card A16 If not +12V replace card C18
50	A14	15	If +12V test Item 51 If not +12V replace card A14
51	C16	15	If +12V test Item 52 If not +12V replace card C16
52	C14	15	If +12V test Item 53 If not +12V replace card C14
53	A20	15	If +12V test Item 54 If not +12V replace card A20
54	A18	15	If +12V test Item 55 If not +12V replace card A18
55	C20	15	If +12V test Item 56 If not +12V replace card C20
56	C18	15	If +12V replace card A16 If not +12V replace card C18

*+12 +2 volts dc

b. Storage Test Manual Isolation Procedures. - The following procedures are performed to isolate and correct malfunctions in the storage section that inhibit loading the DMR program. When referred to the storage manual tests, perform the Bit Dimension Ones Test in paragraph 4-3b(1) first unless specifically directed to do otherwise by the referencing instruction.

(1) Bit dimension ones test. - The following procedure tests the sense amplifiers, MDR, and bit drivers for bytes 0 and 1.

- Step 1. Position rotary switch D at 1 and rotary switch C at 2.
- Step 2. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 3. At C display, set DØ REGISTER to 0000.
- Step 4. Press MAINTENANCE WRITE switch to active position.
- Step 5. Press DISABLE TIMER switch to inactive position.
- Step 6. Press RUN switch.
- Step 7. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 8. At C display, set DØ REGISTER to FFFF.
- Step 9. Press RUN switch.
- Step 10. Press MAINTENANCE WRITE switch to inactive position.
- Step 11. Press MAINTENANCE READ switch to active position.
- Step 12. Press RUN switch.
- Step 13. At C display, observe DØ REGISTER indicators.
 - a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 - b) If register equals 0000, perform Unit 1 Timing Test in paragraph 4-3b(7), page 4-132.
 - c) If register equals any other value, perform Step 14.
- Step 14. Repeat Steps 1 through 12 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (PØ) to 02934, then perform Step 15.
- Step 15. At C display, observe DØ REGISTER indicators.
 - a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 - b) If register equals any other value, perform Step 16.
- Step 16. Repeat Steps 1 through 12 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (PØ) to 01208, then perform Step 17.
- Step 17. At C display, observe DØ REGISTER indicators.
 - a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 - b) If register equals any other value, perform Step 18.
- Step 18. Repeat Steps 1 through 12 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (PØ) to 01BOC, then perform Step 19.
- Step 19. At C display, observe DØ REGISTER indicators.
 - a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 - b) If register equals any other value, perform Step 20.

- Step 20. Repeat Steps 1 through 12 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 04412, then perform Step 21.
- Step 21. At C display, observe D0 REGISTER indicators.
 a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 b) If register equals any other value, perform Step 22.
- Step 22. Repeat Steps 1 through 12 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 04DIC, then perform Step 23.
- Step 23. At C display, observe D0 REGISTER indicators.
 a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 b) If register equals any other value, perform Step 24.
- Step 24. Repeat Steps 1 through 12 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 0561A, then perform Step 25.
- Step 25. At C display, observe D0 REGISTER indicators.
 a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 b) If register equals any other value, perform Step 26.
- Step 26. Repeat Steps 1 through 12 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 05FIE, then perform Step 27.
- Step 27. At C display, observe D0 REGISTER indicators.
 a) If register equals FFFF, perform Bit Dimension Zeros Test in paragraph 4-3b(2), page 4-121.
 b) If register equals any other value, record D0 value and then perform Unit 1 Timing Test in paragraph 4-3b(7), page 4-132, starting with Step 22.

Table 4-23. Bit Dimension Ones Test, Error Displays

<u>D0</u>	<u>REPLACE CARDS*</u>
7FFF	D45, D40 and ABC40
BFFF	D45, D40 and ABC40
DFFF	D45, D40 and ABC38
EFFF	D45, D40 and ABC38
F7FF	D45, D40 and ABC36
FBFF	D42, D38 and ABC36
FDFF	D42, D38 and ABC34
F7FF	D42, D38 and ABC34
FF7F	H45, H40 and EFG40
FFBF	H45, H40 and EFG40
FFDF	H45, H40 and EFG38
FFEF	H45, H40 and EFG38

* All cards are on memory chassis of Unit 1.

Table 4-23. Bit Dimension Ones Test, Error Displays (continued)

<u>DØ</u>	<u>REPLACE CARDS*</u>
FFF7	H45, H40 and EFG36
FFFB	H46, H38 and EFG36
FFFD	H46, H38 and EFG34
FFFE	H46, H38 and EFG34
07FF	D36
FCFF	D36 and H20
FF07	H36
FFFC	H36 and H19
00FF	D34, H20, H12, H05 and H07
FF00	H34, H20, H12, H05 and H07
0000	H11 and H13

(2) Bit dimension zeros test. The following procedure tests the sense amplifiers, MDR, and bit drivers for bytes 0 and 1 using a zeros pattern.

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 4. At C display, set DØ REGISTER to 0000.
- Step 5. Press MAINTENANCE WRITE switch to active position.
- Step 6. Press RUN switch.
- Step 7. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 8. Press MAINTENANCE WRITE switch to inactive position.
- Step 9. Press MAINTENANCE READ switch to active position.
- Step 10. Press RUN switch.
- Step 11. At C display, observe DØ REGISTER indicators.
 - a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals 0000, perform Unit 1 Timing Test in paragraph 4-3b(7), page 4-132.
 - c) If register equals any other value, perform Step 12.
- Step 12. Repeat Steps 1 through 10 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (PØ) to 04934, then perform Step 13.
- Step 13. At C display, observe DØ REGISTER indicators.

- a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals any other value, perform Step 14.
- Step 14. Repeat Steps 1 through 10 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 05108, then perform Step 15.
- Step 15. At C display, observe D0 REGISTER indicators.
- a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals any other value, perform Step 16.
- Step 16. Repeat Steps 1 through 10 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 05B0C, then perform Step 17.
- Step 17. At C display, observe D0 REGISTER indicators.
- a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals any other value, perform Step 18.
- Step 18. Repeat Steps 1 through 10 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 04412, then perform Step 19.
- Step 19. At C display, observe D0 REGISTER indicators.
- a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals any other value, perform Step 20.
- Step 20. Repeat Steps 1 through 10 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 04D1C, then perform Step 21.
- Step 21. At C display, observe D0 REGISTER indicators.
- a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals any other value, perform Step 22.
- Step 22. Repeat Steps 1 through 10 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 0561A, then perform Step 23.
- Step 23. At C display, observe D0 REGISTER indicators.
- a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals any other value, perform Step 24.
- Step 24. Repeat Steps 1 through 10 except in Steps 3 and 7 set PSW INSTRUCTION ADDRESS (P0) to 05F1E, then perform Step 25.
- Step 25. At C display, observe D0 REGISTER indicators.
- a) If register equals 0000, perform Y Dimension Zeros Test in paragraph 4-3b(3), page 4-123.
 - b) If register equals any other value, record D0 value and then perform Unit 1 Timing Test in paragraph 4-3b(7), page 4-132, starting with Step 22.

Table 4-24. Bit Dimension Zeros Test, Error Displays

<u>DØ</u>	<u>REPLACE CARDS*</u>
8000	D45, D40 and ABC40
4000	D45, D40 and ABC40
2000	D45, D40 and ABC38
1000	D45, D40 and ABC38
0800	D45, D40 and ABC36
0400	D42, D38 and ABC36
0200	D42, D38 and ABC34
0100	D42, D38 and ABC34
0080	H45, H40 and EFG40
0040	H45, H40 and EFG40
0020	H45, H40 and EFG38
0010	H45, H40 and EFG38
0008	H45, H40 and EFG36
0004	H46, H38 and EFG36
0002	H46, H38 and EFG34
0001	H46, H38 and EFG34
FC00	D36
0300	D36 and H20
00FC	H36
0003	H36 and H19
FF00	D34, H20, H12, H05, H07 and H18
00FF	H34, H20, H12, H05, H07 and H18
FFFF	H11 and H15

(3) Y dimension zeros test. - The following procedure tests the Y dimension circuitry (Y switches and Y switch selectors) with a zeros pattern.

- Step 1. Ensure rotary switch D is at 1 and rotary switch C is at 2.
- Step 2. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 3. At C display, set DØ REGISTER to 0000.
- Step 4. Set ADDRESS COMPARE switches to 0020.
- Step 5. Press ADDRESS COMPARE WRITE STOP switch to active position.
- Step 6. Press MAINTENANCE WRITE switch to active position.
- Step 7. Press CLOCK RATE CLEAR switch.
- Step 8. Press CLOCK RATE NORMAL indicator-switch.

* All cards are on memory chassis of Unit 1.

- Step 9. Press RUN switch and observe that processor stops with D display (PØ) equal to 00022.
- Step 10. Press SYSTEM RESET switch.
- Step 11. Press ADDRESS COMPARE WRITE STOP switch to inactive position.
- Step 12. Press MAINTENANCE WRITE switch to inactive position.
- Step 13. Press MAINTENANCE READ switch to active position.
- Step 14. Press RUN switch.
- Step 15. At C display, observe DØ REGISTER indicators.
- If register equals 0000, perform Step 16.
 - If register equals any other value (indicating a failure), record actual C display value and D display value minus 2. Then perform Step 16.
- Step 16. Repeat Steps 14 and 15 (fifteen more times) until D display (PØ) equals 00022.
- Step 17. Examine results of Steps 15 and 16.
- If no failures occurred, perform Y Dimension Ones Test in paragraph 4-3b(4).
 - If 16 failures occurred, perform Step 19.
 - If from one to 15 failures occurred, logically OR*all DØ values recorded in Step 15. Then locate resulting value in Table 4-24, page 4-123, and replace card(s) specified for that value.

NOTE

If value is not listed, perform Step 18.

- Step 18. Examine all DØ values recorded in Step 15.
- If bits 16 through 23 do not equal 00 and bits 24 through 31 equal 00, replace cards D52, D53, D54, D55 and D51 on memory chassis of Unit 1.
 - If bits 16 through 23 equal 00 and bits 24 through 31 do not equal 00, replace cards H52, H53, H54, H55 and H51 on memory chassis of Unit 1.
 - If neither bits 16 through 23 nor bits 24 through 31 equal 00, replace cards D36 and F02 on memory chassis of Unit 1.
- Step 19. With a multimeter, measure voltage level at pin 32 of card location H17 on memory chassis of Unit 1.
- If 0 vdc, replace card H17 on memory chassis
 - If +2 vdc, measure voltage level at pin 27 of card location H18 on memory chassis of Unit 1.
 - If $+3 \pm 1$ vdc, perform X Dimension X Drivers Test in paragraph 4-3b(5), page 4-125.
 - If 0 vdc, replace card H18 on memory chassis of Unit 1.

(4) Y dimension ones test. - The following procedure tests the Y dimension circuitry (Y switches and Y switch selectors) with a ones pattern.

- Step 1. Ensure rotary switch D is at 1 and rotary switch C is at 2.
- Step 2. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.

* Refer to paragraph 2-5c, page 2-10, for logical OR procedure.

- Step 3. At C display, set DØ REGISTER to FFFF.
- Step 4. Set ADDRESS COMPARE switches to 0020.
- Step 5. Press ADDRESS COMPARE WRITE STOP switch to active position.
- Step 6. Press MAINTENANCE WRITE switch to active position.
- Step 7. Press CLOCK RATE CLEAR switch.
- Step 8. Press CLOCK RATE NORMAL indicator-switch.
- Step 9. Press RUN switch and observe that processor stops with D display (PØ) equal to 00022.
- Step 10. Press SYSTEM RESET switch.
- Step 11. Press ADDRESS COMPARE WRITE STOP switch to inactive position.
- Step 12. Press MAINTENANCE WRITE switch to inactive position.
- Step 13. Press MAINTENANCE READ switch to active position.
- Step 14. Press RUN switch.
- Step 15. At C display, observe DØ REGISTER indicators.
 - a) If register equals FFFF, perform Step 16.
 - b) If register equals any other value (indicating a failure), record actual C display value and D display value minus 2. Then perform Step 16.
- Step 16. Repeat Steps 14 and 15 (fifteen more times) until D display (PØ) equals 00022.
- Step 17. Examine results of Steps 15 and 16.
 - a) If no failures occurred, perform X Dimension X Drivers Test in paragraph 4-3b(5).
 - b) If from one to 15 failures occurred, logically OR*all DØ values recorded in Step 15. Then locate resulting value in Table 4-23, page 4-120, and replace card(s) specified for that value.

NOTE

If value is not listed, perform Step 18.

- Step 18. Examine all DØ values.
 - a) If bits 16 through 23 do not equal FF and bits 24 through 31 equal FF, replace cards D52, D53, D54, D55 and D51 on memory chassis of Unit 1.
 - b) If bits 16 through 23 equal FF and bits 24 through 31 do not equal FF, replace cards H52, H53, H54, H55 and H51 on memory chassis of Unit 1.
 - c) If neither bits 16 through 23 nor bits 24 through 31 equal FF, replace cards D36 and F02 on memory chassis of Unit 1.

(5) X dimension X drivers test. - The following procedure tests the X drivers and associated circuitry for bytes 0 and 1.

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 4. At C display, set DØ REGISTER to 0000.

* Refer to paragraph 2-5c, page 2-10, for logical OR procedure.

- Step 5. Press MAINTENANCE WRITE switch to active position.
- Step 6. Press RUN switch.
- Step 7. Press MAINTENANCE WRITE switch to inactive position.
- Step 8. Press MAINTENANCE READ switch to active position.
- Step 9. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 10. Press RUN switch.
- Step 11. At C display, observe DØ REGISTER indicators.
- If register equals 0000, perform Step 12.
 - If register equals any other value, record the values in both the C and D displays, then perform Step 12.
- Step 12. At C display, set DØ REGISTER to FFFF.
- Step 13. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 14. Press MAINTENANCE WRITE switch to active position.
- Step 15. Press RUN switch.
- Step 16. Press MAINTENANCE WRITE switch to inactive position.
- Step 17. Press MAINTENANCE READ switch to active position.
- Step 18. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 19. Press RUN switch.
- Step 20. At C display, observe DØ REGISTER indicators.
- If register equals 0000, perform Step 21.
 - If register equals any other value, record values in C and D displays and then perform Step 21.
- Step 21. Repeat Steps 3 through 17 a total of 15 times, each time using a different PØ value, starting with 1); then perform Step 22.
- 0020
 - 0040
 - 0060
 - 0080
 - 00A0
 - 00C0
 - 00E0
 - 2000
 - 2020
 - 2040
 - 2060
 - 2080
 - 20A0
 - 20C0
 - 20E0
- Step 22. Count failing addresses in D display (PØ) during Steps 11 and 20.
- If zero, perform X Dimension X Sinks Test in paragraph 4-3b(6), page 4-128.
 - If one, examine all recorded DØ REGISTER values.
 - If bits 16 through 23 do not equal 00 and bits 24 through 31 equal 00, replace card listed below opposite failing PØ address.

<u>PØ</u>	<u>Replace Card*</u>	<u>PØ</u>	<u>Replace Card*</u>
0000	B20	0080	B20
0020	B20	00A0	B20
0040	B20	00C0	B20
0060	B20	00E0	B20

* All cards are on memory chassis of Unit 1.

<u>PØ</u>	<u>Replace Card*</u>	<u>PØ</u>	<u>Replace Card*</u>
2000	B18	2080	B18
2020	B18	20A0	B18
2040	B18	20C0	B18
2060	B18	20E0	B18

- 2) If bits 16 through 23 equal 00 and bits 24 through 31 do not equal 00, replace memory chassis card listed below opposite failing PØ address.

<u>PØ</u>	<u>Replace Card*</u>	<u>PØ</u>	<u>Replace Card*</u>
0000	F20	2000	F18
0020	F20	2020	F18
0040	F20	2040	F18
0060	F20	2060	F18
0080	F20	2080	F18
00A0	F20	20A0	F18
00C0	F20	20C0	F18
00E0	F20	20E0	F18

- c) If two, examine all DØ REGISTER values recorded in Steps 11 and 20.
- 1) If bits 16 through 23 do not equal 00 and bits 24 through 31 equal 00, replace cards B06, B18 and B20 on memory chassis.*
 - 2) If bits 16 through 23 equal 00 and bits 24 through 31 do not equal 00, replace cards F06, F18 and F20 on memory chassis.*
 - 3) If bits 16 through 23 do not equal 00 and bits 24 through 31 do not equal 00, replace card F03 on memory chassis.*
- d) If seven, examine all DØ REGISTER values recorded in Steps 11 and 20.
- 1) If bits 16 through 23 do not equal 00, replace cards B18 and B20 on memory chassis.*
 - 2) If bits 24 through 31 do not equal 00, replace cards F13 and F20 on memory chassis.*
- e) If eight, replace cards B06, B04 and E02 on memory chassis.*
- f) If 14, replace cards B06, F06 and F03 on memory chassis.*
- g) If 16, examine all DØ REGISTER values recorded in Steps 11 and 20.
- 1) If bits 16 through 23 do not equal 00 and bits 24 through 31 equal 00, replace cards B18, B20, B16 and D03 on memory chassis.*
 - 2) If bits 16 through 23 equal 00 and bits 24 through 31 do not equal 00, replace cards F16, F20, F18 and H13 on memory chassis.*
 - 3) If bits 16 through 23 do not equal 00 and bits 24 through 31 do not equal 00, replace cards H17, H11 and H07 in memory chassis.*

* All cards are on memory chassis of Unit 1.

(6) X dimension X sinks test. - The following procedure tests the X sinks and associated circuitry using zeros and ones patterns.

- Step 1. Position rotary switch D at 1.
- Step 2. Position rotary switch C at 2.
- Step 3. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 4. At C display, set DØ REGISTER to 0000.
- Step 5. Press MAINTENANCE WRITE switch to active position.
- Step 6. Press RUN switch.
- Step 7. Press MAINTENANCE WRITE switch to inactive position.
- Step 8. Press MAINTENANCE READ switch to active position.
- Step 9. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 10. Press RUN switch.
- Step 11. At C display, observe DØ REGISTER indicators.
 - a) If register equals 0000, perform Step 12.
 - b) If register equals any other value, indicating a failing address, record values in C and D displays and then perform Step 20.
- Step 12. At C display, set DØ REGISTER to FFFF.
- Step 13. Press MAINTENANCE WRITE switch to active position.
- Step 14. Press RUN switch.
- Step 15. Press MAINTENANCE WRITE switch to inactive position.
- Step 16. Press MAINTENANCE READ switch to active position.
- Step 17. At D display, set PSW INSTRUCTION ADDRESS (PØ) to 00000.
- Step 18. Press RUN switch.
- Step 19. At C display, observe DØ REGISTER indicators.
 - a) If register equals 0000, perform Step 20.
 - b) If register equals any other value, indicating a failing address, record the values in C and D displays, and then perform Step 20.
- Step 20. Repeat Steps 3 through 11 sixty-three times, each time substituting a different PØ value from the following list (starting with 00100).

PØ Values

1) 00100	9) 00900	17) 01100	25) 01900
2) 00200	10) 00A00	18) 01200	26) 01A00
3) 00300	11) 00B00	19) 01300	27) 01B00
4) 00400	12) 00C00	20) 01400	28) 01C00
5) 00500	13) 00D00	21) 01500	29) 01D00
6) 00600	14) 00E00	22) 01600	30) 01E00
7) 00700	15) 00F00	23) 01700	31) 01F00
8) 00800	16) 01000	24) 01800	32) 04000

33) 04100	41) 04900	49) 05100	57) 05900
34) 04200	42) 04A00	50) 05200	58) 05A00
35) 04300	43) 04B00	51) 05300	59) 05B00
36) 04400	44) 04C00	52) 05400	60) 05C00
37) 04500	45) 04D00	53) 05500	61) 05D00
38) 04600	46) 04E00	54) 05600	62) 05E00
39) 04700	47) 04F00	55) 05700	63) 05F00
40) 04800	48) 05000	56) 05800	

Step 21. Count the number of failing addresses (PØ values) found during Steps 11 and 19.

- a) If zero, perform the Multiplexer Channel load failure procedures of paragraph 3-2, page 3-1.
- b) If one, examine DØ values recorded in Steps 11 and 19.
 - 1) If bits 16 through 23 do not equal 00 and bits 24 through 31 equal 00, replace card listed in Table 4-25, page 4-130, opposite failing PØ address.
 - 2) If bits 16 through 23 equal 00 and bits 24 through 31 do not equal 00, replace card listed in Table 4-26, page 4-131, opposite failing PØ address.
- c) If seven, logically OR** all failing PØ addresses and record resulting value, then examine all DØ values recorded during Steps 11 and 19.
 - 1) If bits 16 through 23 do not equal 00 and bits 24 through 31 equal 00, replace card listed in Table 4-25, page 4-130, opposite PØ value obtained by performing the logical OR.
 - 2) If bits 16 through 23 equal 00 and bits 24 through 31 do not equal 00, replace card listed in Table 4-26, page 4-131, opposite PØ value obtained by performing the logical OR.
- d) If eight or 28, examine all DØ values recorded during Steps 11 and 19.
 - 1) If bits 16 through 23 do not equal 00 and bits 24 through 31 equal 00, replace cards C04 and B04 on memory chassis.*
 - 2) If bits 16 through 23 equal 00 and bits 24 through 31 do not equal 00, replace cards G04 and F04 on memory chassis.*
 - 3) If bits 16 through 23 equal 00 and bits 24 through 31 equal 00, replace cards D01 and D02 on memory chassis.*
- e) If 32, replace cards H16, H10, H07, H13 and H03 on memory chassis.*

* All cards are on memory chassis of Unit 1.

** Refer to paragraph 2-5c, page 2-10, for logical OR procedure.

Table 4-25. X Dimension Test Error Displays, Part 1

<u>PØ</u>	<u>REPLACE CARD*</u>	<u>PØ</u>	<u>REPLACE CARD*</u>
00000	A16	04000	A20
00100	A16	04100	A20
00200	A16	04200	A20
00300	A16	04300	A20
00400	A16	04400	A20
00500	A16	04500	A20
00600	A16	04600	A20
00700	A16	04700	A20
00800	A14	04800	A18
00900	A14	04900	A18
00A00	A14	04A00	A18
00B00	A14	04B00	A18
00C00	A14	04C00	A18
00D00	A14	04D00	A18
00E00	A14	04E00	A18
00F00	A14	04F00	A18
01000	C16	05000	C20
01100	C16	05100	C20
01200	C16	05200	C20
01300	C16	05300	C20
01400	C16	05400	C20
01500	C16	05500	C20
01600	C16	05600	C20
01700	C16	05700	C20
01800	C14	05800	C18
01900	C14	05900	C18
01A00	C14	05A00	C18
01B00	C14	05B00	C18
01C00	C14	05C00	C18
01D00	C14	05D00	C18
01E00	C14	05E00	C18
01F00	C14	05F00	C18

* All cards are on memory chassis of Unit 1.

Table 4-26. x Dimension Test Error Displays, Part 2

<u>PØ</u>	<u>REPLACE CARD*</u>	<u>PØ</u>	<u>REPLACE CARD*</u>
00000	E16	04000	E20
00100	E16	04100	E20
00200	E16	04200	E20
00300	E16	04300	E20
00400	E16	04400	E20
00500	E16	04500	E20
00600	E16	04600	E20
00700	E16	04700	E20
00800	E14	04800	E18
00900	E14	04900	E18
00A00	E14	04A00	E18
00B00	E14	04B00	E18
00C00	E14	04C00	E18
00D00	E14	04D00	E18
00E00	E14	04E00	E18
00F00	E14	04F00	E18
01000	G16	05000	G20
01100	G16	05100	G20
01200	G16	05200	G20
01300	G16	05300	G20
01400	G16	05400	G20
01500	G16	05500	G20
01600	G16	05600	G20
01700	G16	05700	G20
01800	G14	05800	G18
01900	G14	05900	G18
01A00	G14	05A00	G18
01B00	G14	05B00	G18
01C00	G14	05C00	G18
01D00	G14	05D00	G18
01E00	G14	05E00	G18
01F00	G14	05F00	G18

* All cards are on memory chassis of Unit 1.

(7) Unit 1 timing test. - The following procedure tests the main timing and control circuitry of memory unit 1 for proper operation.

NOTE

All switches and indicators referenced in Steps 1 through 9 of this procedure are on memory chassis maintenance panel of Unit 1.

- Step 1. Set LINE ON/OFF switch to OFF.
- Step 2. Press RUN switch and observe DL RUN indicator.
 - a) If lit, perform Step 3.
 - b) If extinguished, replace cards HO5, GO2, DO3, EO1, H10 and HO9 on memory chassis of Unit 1.
- Step 3. Press STOP switch and observe DL RUN indicator.
 - a) If extinguished, perform Step 4.
 - b) If lit, replace cards EO1, HO9 and HO7 on memory chassis of Unit 1.
- Step 4. Press MSTR SET switch and observe the following:
 - a) If either 0 WR CTL or 1 WR CTL indicator fails to light, replace card GO2 on memory chassis of Unit 1.
 - b) If both 0 WR CTL and 1 WR CTL indicators light, perform Step 5.
- Step 5. Press TIMING CLR switch and observe the following:
 - a) If either 0 WR CTL or 1 WR CTL indicator is lit, replace card GO2 on memory chassis of Unit 1.
 - b) If neither 0 WR CTL nor 1 WR CTL indicator is lit, perform Step 6.
- Step 6. Press 0 WR CTL indicator-switch.
- Step 7. Press 1 WR CTL indicator-switch.
- Step 8. Press RUN switch.
- Step 9. With a multimeter, test Item 1 in Table 4-27, page 4-134.

NOTE

Unless otherwise specified, all switches and indicators referenced in Steps 10 through 23 are on the processor maintenance or operator panel.

- Step 10. Press SYSTEM RESET switch.
- Step 11. At D display, set PSW INSTRUCTION ADDRESS (P0) to 1FFFF.
- Step 12. Press MAINTENANCE WRITE switch to active position.
- Step 13. Press RUN switch.
- Step 14. At memory chassis maintenance panel of Unit 1, observe ADDRESS (SA) indicators.
 - a) If all ADDRESS indicators are lit, perform Step 17.
 - b) If one or more ADDRESS indicators are extinguished, record SA indicator number(s) and perform Step 15.
- Step 15. At memory chassis maintenance panel of Unit 1, set LINE ON/OFF switch to OFF.

- Step 16. At memory chassis maintenance panel of Unit 1, press MSTR SET switch and observe ADDRESS (SA) indicators.
- If one or more ADDRESS indicators are extinguished, replace cards listed in Table 4-28, page 4-135, opposite failing SA indicator.
 - If all ADDRESS indicators are lit, replace cards listed in Table 4-29, page 4-135, opposite failing SA indicator recorded in Step 14.
- Step 17. Press SYSTEM RESET switch.
- Step 18. Press RUN switch.
- Step 19. At memory chassis maintenance panel of Unit 1, observe ADDRESS (SA) indicators.
- If all ADDRESS indicators are extinguished, perform Step 21.
 - If one or more ADDRESS indicators are lit, record SA indicator number(s) and perform Step 20.
- Step 20. Press TIMING CLR switch and observe ADDRESS (SA) indicators.
- If one or more ADDRESS indicators are lit, replace cards listed in Table 4-28, page 4-135, opposite failing SA indicator.
 - If all ADDRESS indicators are extinguished, replace cards listed in Table 4-29, page 4-135, opposite failing SA indicator recorded in Step 19.
- Step 21. Press MAINTENANCE READ switch to inactive position.
- Step 22. Press MAINTENANCE WRITE switch to active position.
- Step 23. Press RUN switch.
- Step 24. At memory chassis maintenance panel of Unit 1, observe BYTE (D) indicators.
- If one or more BYTE indicators fail to light, record D indicator number(s) and perform Step 25.
 - If all BYTE indicators light, perform Step 27.
- Step 25. At memory chassis maintenance panel of Unit 1, set LINE ON/OFF switch to OFF.
- Step 26. At memory chassis maintenance panel of Unit 1, press MSTR SET and observe BYTE (D) indicators.
- If one or more BYTE indicators fail to light, replace cards listed in Table 4-30, page 4-136, opposite failing D indicator.
 - If all BYTE indicators light, replace cards listed in Table 4-31, page 4-136, opposite failing D indicator recorded in Step 24.
- Step 27. Press SYSTEM RESET switch.
- Step 28. Press RUN switch.
- Step 29. At memory chassis maintenance panel of Unit 1, observe BYTE (D) indicators.
- If one or more BYTE indicators are lit, record D indicator number(s) and perform Step 30.
 - If all BYTE indicators are extinguished, do one of the following:
 - If referred to this test from Bit Dimension Ones Test in paragraph 4-3b(1), replace cards listed in Table 4-23, page 4-120, opposite D0 value recorded in Step 27 of referencing test.

- 2) If referred to this test from Bit Dimension Zeros Test in paragraph 4-3b(2), replace cards listed in Table 4-24, page 4-123, opposite DØ value recorded in Step 25 of referencing test.

Step 30. At memory chassis maintenance panel of Unit 1, set LINE ON/OFF switch to OFF.

Step 31. At memory chassis maintenance panel of Unit 1, press TIMING CLR switch and observe BYTE (D) indicators.

- a) If one or more BYTE indicators are lit, replace cards listed in Table 4-30, page 4-136, opposite failing D indicator.
- b) If all BYTE indicators are extinguished, replace cards listed in Table 4-31, page 4-136, opposite failing D indicator recorded in Step 29.

Table 4-27. Unit 1 Timing Test, Multimeter Testing

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
1	D03	TP12	If +2.2V test Item 2 If not +2.2V test Item 3
2	H13	TP12	If +2.2V test Item 6 If not +2.2V test Item 4
3	H13	TP4	If +3.0V test Item 5 If not +3.0V replace card H13
4	H13	TP1	If +3.0V test Item 5 If not +3.0V replace card H13
5	H11	TP3	If +0.8V replace cards D03 and H13 If not +0.8V replace card H11
6	H10	TP12	If +1.0V test Item 7 If not +1.0V replace card H10
7	H16	TP15	If +1.3V perform Step 10 of para 4-3b(7), page 4-132 If not +1.3V test Item 8
8	H16	TP14	If +1.7V replace card H16 If not +1.7V replace card H10

* All voltages ± 0.4 volts.

Table 4-28. Unit 1 Timing Test, SA Indicators (Part 1)

<u>SA INDICATOR</u>	<u>REPLACE CARDS*</u>	<u>SA INDICATOR</u>	<u>REPLACE CARDS*</u>
15	D04 and D18	23	D01 and D18
16	E01 and D16	24	F03 and D16
17	D02 and D14	25	F03 and D14
18	E01 and D12	26	F03 and D12
19	D02 and D18	27	D04 and D18
20	D02 and D16	28	F02 and D16
21	D01 and D14	29	F02 and D14
22	D01 and D12	30	F02 and D12

Table 4-29. Unit 1 Timing Test, SA Indicators (Part 2)

<u>SA INDICATOR</u>	<u>REPLACE CARD*</u>	<u>SA INDICATOR</u>	<u>REPLACE CARD*</u>
15	C02	23	B02
16	C02	24	B02
17	C02	25	B02
18	B02	26	C02
19	C02	27	C02
20	C02	28	C02
21	C02	29	C02
22	C02	30	C02

* All cards are on memory chassis of Unit 1.

Table 4-30. Unit 1 Timing Test, D Indicators (Part 1)

<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>	<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>
D0	D45 and D18	D8	H45 and D18
D1	D45 and D16	D9	H45 and D16
D2	D44 and D14	D10	H44 and D14
D3	D44 and D12	D11	H44 and D12
D4	D43 and D18	D12	H43 and D18
D5	D43 and D16	D13	H43 and D16
D6	D42 and D14	D14	H42 and D14
D7	D42 and D12	D15	H42 and D12
PAR 0	D46 and D10	PAR 1	H46 and D10

Table 4-31. Unit 1 Timing Test, D Indicators (Part 2)

<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>	<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>
D0	B03 and C60**	D8	B02 and C59**
D1	B03 and C60**	D9	B02 and C59**
D2	B03 and C60**	D10	B02 and C59**
D3	B03 and C60**	D11	B02 and C59**
D4	B03 and C60**	D12	B02 and C58**
D5	B03 and C60**	D13	B02 and C58**
D6	B03 and C59**	D14	C02 and C58**
D7	B02 and C59**	D15	C02 and C58**

* Unless otherwise specified, all cards are on memory chassis of Unit 1.

** These cards are on processor chassis.

(8) Unit 2 timing test. - The following procedure tests the main timing and control circuitry of memory unit 2 for proper operation.

NOTE

All switches and indicators referenced in Steps 1 through 9 are on the memory chassis maintenance panel of Unit 2.

- Step 1. Set LINE ON/OFF switch to OFF.
- Step 2. Press RUN switch and observe DL RUN indicator.
 - a) If lit, perform Step 3.
 - b) If extinguished, replace cards H05, G02, D03, E01, H10 and H09 on memory chassis of Unit 2.
- Step 3. Press STOP switch and observe DL RUN indicator.
 - a) If extinguished, perform Step 4.
 - b) If lit, replace cards E01, H09 and H07 on memory chassis of Unit 2.
- Step 4. Press MSTR SET switch and observe the following:
 - a) If either 0 WR CTL or 1 WR CTL indicator fails to light, replace card G02 on memory chassis of Unit 2.
 - b) If both 0 WR CTL and 1 WR CTL indicators light, perform Step 5.
- Step 5. Press TIMING CLR switch and observe the following:
 - a) If either 0 WR CTL or 1 WR CTL indicator is lit, replace card G02 on memory chassis of Unit 2.
 - b) If neither 0 WR CTL or 1 WR CTL indicator is lit, perform Step 6.
- Step 6. Press 0 WR CTL indicator-switch.
- Step 7. Press 1 WR CTL indicator-switch.
- Step 8. Press RUN switch.
- Step 9. With a multimeter, test Item 1 in Table 4-32, page 4-139.

NOTE

Unless otherwise specified, all switches and indicators referenced in Steps 10 through 23 are on the processor maintenance or operator panel.

- Step 10. Press SYSTEM RESET switch.
- Step 11. At D display, set PSW INSTRUCTION ADDRESS (P0) to 1FFFF.
- Step 12. Press MAINTENANCE WRITE switch to active position.
- Step 13. Press RUN switch.
- Step 14. At memory chassis maintenance panel of Unit 2, observe ADDRESS (SA) indicators.
 - a) If all ADDRESS indicators are lit, perform Step 17.
 - b) If one or more ADDRESS indicators are extinguished, record SA indicator number(s) and perform Step 15.
- Step 15. At memory chassis maintenance panel of Unit 2, set LINE ON/OFF switch to OFF.
- Step 16. At memory chassis maintenance panel of Unit 2, press MSTR SET switch and observe ADDRESS (SA) indicators.
 - a) If one or more ADDRESS indicators are extinguished, replace cards listed in Table 4-33, page 4-139, opposite failing SA indicator.

- b) If all ADDRESS indicators are lit, replace cards listed in Table 4-34, page 4-140, opposite failing SA indicator recorded in Step 14.
- Step 17. Press SYSTEM RESET switch.
- Step 18. Press RUN switch.
- Step 19. At memory chassis maintenance panel of Unit 2, observe ADDRESS (SA) indicators.
 - a) If all ADDRESS indicators are extinguished, perform Step 21.
 - b) If one or more ADDRESS indicators are lit, record SA indicator number(s) and perform Step 20.
- Step 20. Press TIMING CLR switch and observe ADDRESS (SA) indicators.
 - a) If one or more ADDRESS indicators are lit, replace cards listed in Table 4-33, page 4-139, opposite failing SA indicator.
 - b) If all ADDRESS indicators are extinguished, replace cards listed in Table 4-34, page 4-140, opposite failing SA indicator recorded in Step 19.
- Step 21. Press MAINTENANCE READ switch to inactive position.
- Step 22. Press MAINTENANCE WRITE switch to active position.
- Step 23. Press RUN switch.
- Step 24. At memory chassis maintenance panel of Unit 2 observe BYTE (D) indicators.
 - a) If one or more BYTE indicators fail to light, record D indicator number(s) and perform Step 25.
 - b) If all BYTE indicators light, perform Step 27.
- Step 25. At memory chassis maintenance panel of Unit 2, set LINE ON/OFF switch to OFF.
- Step 26. At memory chassis maintenance panel of Unit 2, press MSTR SET and observe BYTE (D) indicators.
 - a) If one or more BYTE indicators fail to light, replace cards listed in Table 4-35, page 4-140, opposite failing D indicator.
 - b) If all BYTE indicators light, replace cards listed in Table 4-36, page 4-140, opposite failing D indicator recorded in Step 24.
- Step 27. Press SYSTEM RESET switch.
- Step 28. Press RUN switch.
- Step 29. At memory chassis maintenance panel of Unit 2, observe BYTE (D) indicators, recording D indicators that are lit. Then perform Step 30.
- Step 30. At memory chassis maintenance panel of Unit 2, set LINE ON/OFF switch to OFF.
- Step 31. At memory chassis maintenance panel of Unit 2, press TIMING CLR switch and observe BYTE (D) indicators.
 - a) If one or more BYTE indicators are lit, replace cards listed in Table 4-35, page 4-140, opposite failing D indicator.
 - b) If all BYTE indicators are extinguished, replace cards listed in Table 4-36, page 4-140, opposite failing D indicator recorded in Step 29.

Table 4-32. Unit 2 Timing Test, Multimeter Testing

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
1	D03	TP12	If +2.2V test Item 2 If not +2.2V test Item 3
2	H13	TP12	If +2.2V test Item 6 If not +2.2V test Item 4
3	H13	TP4	If +3.0V test Item 5 If not +3.0V replace card H13
4	H13	TP1	If +3.0V test Item 5 If not +3.0V replace card H13
5	H11	TP3	If +0.8V replace cards D03 and H13 If not +0.8V replace card H11
6	H10	TP12	If +1.0V test Item 7 If not +1.0V replace card H10
7	H16	TP15	If +1.3V perform Step 10 of para 4-3b(8), page 4-137 If not +1.3V test Item 8
8	H16	TP14	If +1.7V replace card H16 If not +1.7V replace card H10

* All voltages ± 0.4 volts.

Table 4-33. Unit 2 Timing Test, SA Indicators (Part 1)

<u>SA INDICATOR</u>	<u>REPLACE CARDS*</u>	<u>SA INDICATOR</u>	<u>REPLACE CARDS*</u>
15	D04 and D18	23	D01 and D18
16	E01 and D16	24	F03 and D16
17	D02 and D14	25	F03 and D14
18	E01 and D12	26	F03 and D12
19	D02 and D18	27	D04 and D18
20	D02 and D16	28	F02 and D16
21	D01 and D14	29	F02 and D14
22	D01 and D12	30	F02 and D12

* Unless otherwise specified, all cards are on memory chassis of Unit 2.

Table 4-34. Unit 2 Timing Test, SA Indicators (Part 2)

<u>SA INDICATOR</u>	<u>REPLACE CARD*</u>	<u>SA INDICATOR</u>	<u>REPLACE CARD*</u>
15	C02	23	B02
16	C02	24	B02
17	C02	25	B02
18	B02	26	C02
19	C02	27	C02
20	C02	28	C02
21	C02	29	C02
22	C02	30	C02

Table 4-35. Unit 2 Timing Test, D Indicators (Part 1)

<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>	<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>
D0	D45 and D18	D8	H45 and D18
D1	D45 and D16	D9	H45 and D16
D2	D44 and D14	D10	H44 and D14
D3	D44 and D12	D11	H44 and D12
D4	D43 and D18	D12	H43 and D18
D5	D43 and D16	D13	H43 and D16
D6	D42 and D14	D14	H42 and D14
D7	D42 and D12	D15	H42 and D12
PAR 0	D46 and D10	PAR 1	H46 and D10

Table 4-36. Unit 2 Timing Test, D Indicators (Part 2)

<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>	<u>D INDICATOR</u>	<u>REPLACE CARDS*</u>
D0	B03 and C60**	D8	B02 and C49**
D1	B03 and C60**	D9	B02 and C59**
D2	B03 and C60**	D10	B02 and C59**
D3	B03 and C60**	D11	B02 and C59**
D4	B03 and C60**	D12	B02 and C58**
D5	B03 and C60**	D13	B02 and C58**
D6	B03 and C59**	D14	C02 and C58**
D7	B02 and C59**	D15	C02 and C58**

* Unless otherwise specified, all cards are on memory chassis of Unit 2

** These cards are on processor chassis.

(9) Parity generator/checker malfunction isolation procedure. - Referral to this paragraph indicates a malfunction occurred in either the memory parity generator/checker circuitry or in the memory proper. Perform the following steps:

- Step 1. Press SYSTEM RESET switch.
- Step 2. Position rotary switch D at 1.
- Step 3. Position rotary switch C at 2.
- Step 4. At C display, set DØ REGISTER to FFFF.
- Step 5. Press MAINTENANCE WRITE switch to active position.
- Step 6. Press DISABLE TIMER switch to inactive position, then press RUN switch.
- Step 7. At memory maintenance panel, observe BYTE (D) indicators.
 - a) If D indicators 0 through 15 are all lit, perform Step 8.
 - b) If D indicators 0 through 15 are not all lit, refer to manual isolation procedures in paragraph 4-3b, page 4-119.
- Step 8. At memory maintenance panel, observe PAR 0 and PAR 1 indicators.
 - a) If both indicators are lit, perform Step 15.
 - b) If PAR 0 indicator is extinguished, perform Step 9.
 - c) If PAR 1 indicator is extinguished, perform Step 12.
- Step 9. At memory maintenance panel, set BIT INTER/NORM switch to INTER.
- Step 10. Press RUN switch.
- Step 11. At memory maintenance panel, observe PAR 0 indicator.
 - a) If lit, replace cards D10 and D46 on memory chassis of Unit 1.
 - b) If extinguished, replace cards D41 and E02 on memory chassis of Unit 1.
- Step 12. At memory maintenance panel set BIT INTER/NORM switch to INTER.
- Step 13. Press RUN switch.
- Step 14. At memory maintenance panel, observe PAR 1 indicator.
 - a) If lit, replace cards D10 and H46 on memory chassis of Unit 1.
 - b) If extinguished, replace cards H13, H14 and H41 on memory chassis of Unit 1.
- Step 15. Press SYSTEM RESET switch.
- Step 16. At C display, set DØ REGISTER to FFFF.
- Step 17. Press MAINTENANCE WRITE switch to inactive position.
- Step 18. Press MAINTENANCE READ switch to active position.
- Step 19. Press CLOCK RATE INST indicator-switch.
- Step 20. Press RUN switch.
- Step 21. At memory maintenance panel, observe BYTE (D) indicators.
 - a) If D indicators 0 through 15 are all lit, perform Step 22.
 - b) If D indicators 0 through 15 are not all lit, refer to manual isolation procedures in paragraph 4-3b, page 4-119.
- Step 22. At memory maintenance panel, observe PAR 0 and PAR 1 indicators.
 - a) If both indicators are lit, perform Step 29.
 - b) If PAR 0 indicator is extinguished, perform Step 23.
 - c) If PAR 1 indicator is extinguished, perform Step 26.

- Step 23. At memory maintenance panel, set BIT INTER/NORM switch to INTER.
- Step 24. Press RUN switch.
- Step 25. At memory maintenance panel, observe PAR 0 indicator.
a) If lit, replace cards ABC42 and D38 on memory chassis of Unit 1.
b) If extinguished, perform Step 46.
- Step 26. At memory maintenance panel, set BIT INTER/NORM switch to INTER.
- Step 27. Press RUN switch.
- Step 28. At memory maintenance panel, observe PAR 1 indicator.
a) If lit, replace cards EFG42 and H38 on memory chassis of Unit 1.
b) If extinguished, perform Step 46.
- Step 29. Press SYSTEM RESET switch.
- Step 30. Press MAINTENANCE READ switch to inactive position.
- Step 31. Press MAINTENANCE WRITE switch to active position.
- Step 32. Press RUN switch.
- Step 33. At memory maintenance panel, observe BYTE (D) indicators.
a) If one or more D indicators are lit, refer to manual isolation procedures in paragraph 4-3b, page 4-119.
b) If D indicators 0 through 15 are all extinguished, perform Step 34.
- Step 34. At C display, set DØ REGISTER to FFFF.
- Step 35. Press CLOCK RATE NORM indicator-switch.
- Step 36. Press RUN switch.
- Step 37. Press STOP switch.
- Step 38. Press MAINTENANCE WRITE switch to inactive position.
- Step 39. Press MAINTENANCE READ switch to active position.
- Step 40. Press RUN switch and observe STORAGE PARITY CHECK indicator.
a) If lit, perform Step 41.
b) If extinguished, perform Step 46.
- Step 41. At D display, observe PSW INSTRUCTION ADDRESS (PØ) indicators and record value.
- Step 42. At D display, set PSW INSTRUCTION ADDRESS (PØ) to the value recorded in Step 41 minus 2.
- Step 43. Press CLOCK RATE INST indicator-switch.
- Step 44. Press RUN switch.
- Step 45. At memory maintenance panel, observe BYTE (D) indicators.
a) If D indicators 0 through 15 are all lit, perform Step 46.
b) If D indicators 0 through 15 are not all lit, refer to manual isolation procedures in paragraph 4-3b, page 4-119.
- Step 46. Press SYSTEM RESET switch.
- Step 47. Press CLOCK RATE INST indicator-switch.
- Step 48. Press RUN switch.

- Step 49. At memory maintenance panel, observe the BYTE 0 and BYTE 1 PAR CHK indicators.
- If BYTE 0 PAR CHK indicator is lit, perform Step 50.
 - If BYTE 1 PAR CHK indicator is lit, perform Step 51.
 - If neither BYTE PAR CHK indicator is lit, replace cards D35, D03, H35, H03, D41 and H41 on memory chassis of Unit 1.
- Step 50. With a multimeter, test Item 1 in Table 4-37.
- Step 51. With a multimeter, test Item 4 in Table 4-37.

Table 4-37. Parity Generator/Checker, Multimeter Testing

<u>ITEM</u>	<u>CARD LOCATION</u>	<u>TEST POINT</u>	<u>REMARKS*</u>
1	G01	TP12	If L probe Item 2 If H replace card G01
2	H12	TP2	If H probe Item 3 If L replace card H12
3	D35	TP2	If L replace cards D35 and D03 If H replace card D35
4	G01	TP4	If L probe Item 5 If H replace card G01
5	H36	TP7	If H probe Item 6 If L replace card H36
6	H35	TP2	If L replace cards H03 and H35 If H replace card H35

* L = zero volts, H = value greater than +2 vdc. All cards are on memory chassis of Unit 1.

(10) Procedure to differentiate between X and bit dimension failures. - There are instances in which a malfunction in the X dimension circuitry (an X sink or X driver being shorted and therefore one-half word current existing for all addresses in a given stack) would be detected during the bit dimension tests as a bit dimension type malfunction. If the corrective action specified in the bit dimension tests does not correct the problem, proceed as follows:

- Step 1. Press SYSTEM RESET switch.
- Step 2. At D display, set PSW INSTRUCTION ADDRESS (P0) to the value given below for the indicated P0 stop and memory size.

<u>If P0 Stop Was</u>	<u>Set P0 To</u>
1A70 or 1ABA	182A
1A80 or 1ACA	17B2
1A7C or 1AC6	16B2 (48K)
1A7C or 1AC6	1732 (all other sizes)

- Step 3. Press RUN switch.
- Step 4. At D display, observe PSW INSTRUCTION ADDRESS (P0) indicators.
Then locate corresponding value in storage test error stop listing
(Table 2-1, page 2-) and proceed as with any normal error stop.

SECTION 5

SORT-IT LISTING

5-1. GENERAL. - The malfunction isolation data in this section of the manual was generated by SORT-IT, which is a general purpose sort program designed to edit, sort, and list synthesized malfunction data in specified formats. The listing is divided into eight parts, each of which corresponds to a unique category of malfunction data. The eight categories are as follows:

- 1) S1L - which contains the data necessary to isolate malfunctions that cause a load failure when attempting to load the 9400 DMR program from a device on Selector Channel 1.
- 2) S2L - which contains the data necessary to isolate malfunctions that cause a load failure when attempting to load the 9400 DMR program from a device on Selector Channel 2.
- 3) MXL - which contains the data necessary to isolate malfunctions that cause a load failure when attempting to load the 9400 DMR program from a device on the Multiplexer Channel.
- 4) PRL - which contains the data necessary to isolate malfunctions that cause a programmed error stop or loop condition during execution of the DMR Prelude program.
- 5) DMR - which contains the data necessary to isolate malfunctions that cause a programmed error stop or loop condition during execution of the CPU Test portion of the DMR program.
- 6) MXR - which contains the data necessary to isolate malfunctions that cause a programmed error stop or loop condition during execution of the Multiplexer Channel Test portion of the DMR program.
- 7) S1R - which contains the data necessary to isolate malfunctions that cause a programmed error stop or loop condition during execution of the Selector Channel 1 Test program.
- 8) S2R - which contains the data necessary to isolate malfunctions that cause a programmed error stop or loop condition during execution of the Selector Channel 2 Test program.

The format of the SORT-IT listing is basically the same for all eight categories of malfunction data. A sample entry from the listing in S1L format is shown in Figure 5-1, page 5-3. As shown in the illustration the left-most column of the listing contains the hexadecimal values observed in the D1 display (PSW Instruction Address Register) for a given malfunction during the simulation phase of the diagnostic's development.

The second column from the left, headed LSURL, categorizes the malfunction causing a particular error display by identifying the channel and loading device, indicating whether or not the program loaded successfully, and specifying whether the program ran to completion, or stopped or looped when it was executed. Data in the LSURL column is interpreted as described in Figure 5-2, page 5-3.

The next five to nine columns (exact number is determined by malfunction category) contain the hexadecimal values observed in various A, B, C, and D displays for a given malfunction during the simulation phase of the diagnostic's development.

The next column to the right, headed FIG, identifies the figure number (in SD 10114-00) containing the malfunctioning card responsible for a given error display. The location of the failing card is determined by use of the figure number/card locator cross reference in Table 5-1.

The extreme right-hand column in all formatted lists (except MXR)* is headed LOAD and contains data derived from observing the LOAD indicators on the Operator Panel. Data in the LOAD column is interpreted as shown in Figure 5-3, page 5-4.

Table 5-1. Figure Number/Card Locator Cross Reference

FIG. NO.	CARD LOC	FIG. NO.	CARD LOC	FIG. NO.	CARD LOC	FIG. NO.	CARD LOC	FIG. NO.	CARD LOC
100	E26	212	B56	286	B51	412	A50	615	D13
101	E21	213	B59	287	B50	413	A37	616	D12
102	E22	214	B58	288	B24	414	A42	617	D47
103	E19	215	B60	289	B23	415	A52	618	D46
104	E18	216	B55	290	B22	416	A54	619	D45
105	E16	217	B54	291	B21	417	A46	620	D19
106	E13	220	C56	292	B48	418	A39	621	D20
107	E15	221	C55	293	B20	419	A41	622	D21
108	E08	222	C54	294	B46	500	A26	623	D11
109	E07	223	C53	295	B19	502	A24	624	D32
110	E11	225	B44	296	B47	503	A23	650	D39
111	E10	226	B43	301	C21	504	A22	651	D38
112	E12	236	C32	302	C20	505	A33	652	D37
113	D23	237	C31	303	C19	506	A32	653	D34
115	D22	238	C30	304	C18	507	A30	654	D08
116	E24	239	B42	305	C17	508	A29	655	D06
118	E14	240	B41	306	C15	509	A28	656	D24
150	C52	241	B39	307	C14	510	A27	657	D18
151	C51	242	B38	308	C13	511	A21	658	D17
152	C49	243	B37	309	C12	512	A25	659	D07
153	C48	244	B31	310	C11	513	A18	660	D05
154	C47	245	B30	311	C10	515	A16	661	D04
155	C46	246	B29	312	C08	516	A15	700	E53
156	C45	247	B28	313	C07	517	A20	701	E52
158	C35	248	B27	314	B17	518	A31	702	E51
159	C36	249	B26	315	B16	600	D52	703	E50
160	C33	250	C42	321	C25	601	D51	704	E48
161	B34	251	C40	322	C23	602	D50	705	E47
162	B35	252	C39	323	C22	603	D48	706	E46
163	B36	253	C38	401	A36	604	D43	707	E45
165	D35	254	C37	402	A38	605	D42	708	E55
167	D36	255	C43	403	A43	606	D40	709	D54
203	A35	270	C04	404	A51	607	D44	710	E54
204	B32	271	C05	405	A53	608	D56	711	E29
206	C60	272	C29	406	A55	609	D55	712	E43
207	C59	273	C28	407	A56	610	D53	713	E42
208	C58	274	C27	408	A44	611	D10	714	E40
209	B63	275	C06	409	A45	612	D16	715	E39
210	B62	278	C24	410	A47	613	D15	716	E31
211	B57	285	B45	411	A49	614	D14	717	E38

* In MXR list, extreme right-hand column is headed PC (print code) and pertains to console printouts during Multiplexer Channel Test portion of DMR program.

Table 5-1. Figure Number/Card Locator Cross Reference (Cont.)

FIG. NO.	CARD LOC	FIG. NO.	CARD LOC	FIG. NO.	CARD LOC	FIG. NO.	CARD LOC	FIG. NO.	CARD LOC
718	E37	723	E30	753	D26	757	D30	761	E04
719	E36	724	E35	754	E28	758	E44	218	B53
720	E33	750	D29	755	E27	759	E09	219	B52
721	E34	751	D28	756	D31	760	E05	276	C26
722	E32	752	D27						

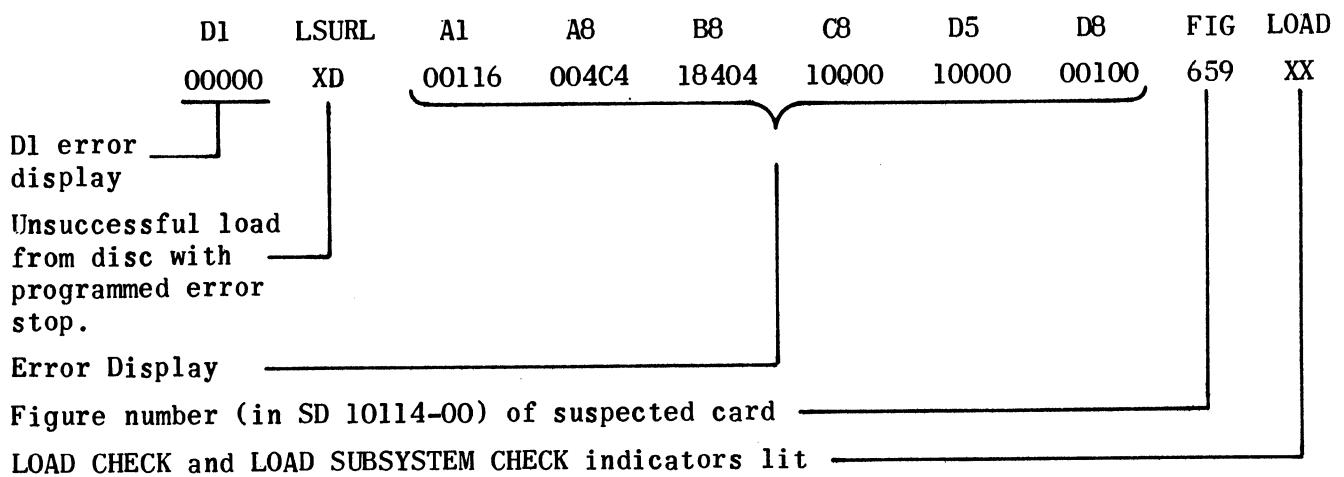


Figure 5-1. Typical Entry From SORT-IT Listing (SIL Format)

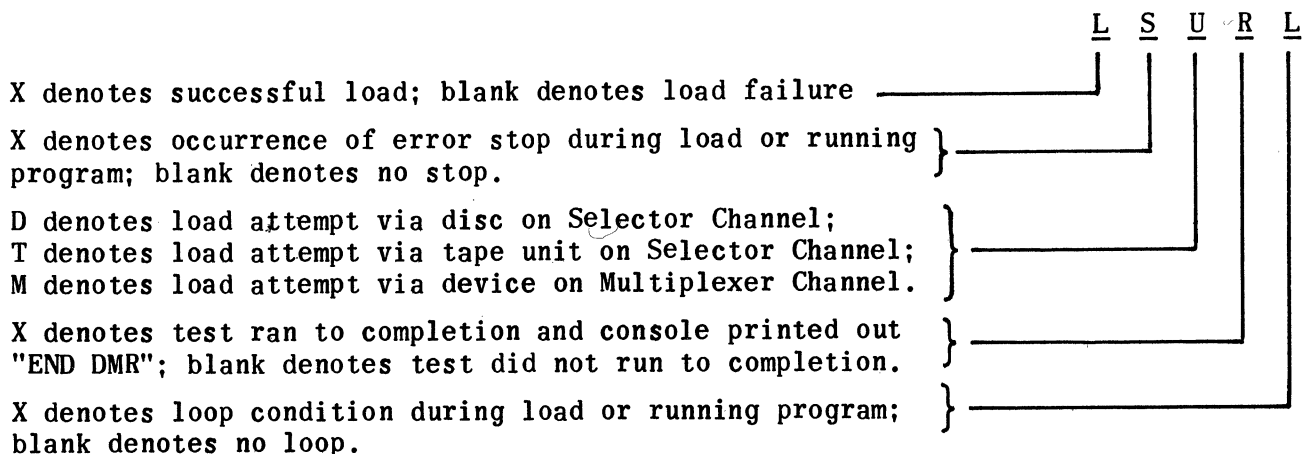


Figure 5-2. Interpretation of LSURL Data

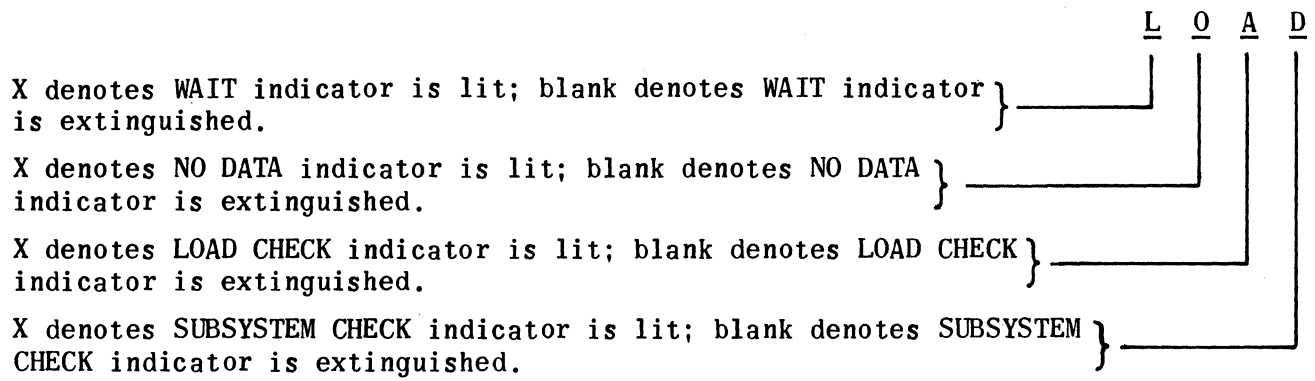


Figure 5-3. Interpretation of LOAD Data

5-2. SIL FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions that cause either of the following conditions:

- 1) a load failure condition when loading from a device connected to Selector Channel 1, or
- 2) an error loop condition with the D1 display equal to 00F04 through 00F08 after a successful load from a device connected to Selector Channel 1.

To utilize this data perform the following steps:

- Step 1. Record hexadecimal values observed in D1, A1, A8, B8, C8, D5, and D8 displays.
- Step 2. Construct LSURL field by means of the following:
 - a) Did load attempt succeed? If yes, record an X in left-most L position; if no, leave left-most L position blank.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) What loading device was used? If tape unit, record a T in U position; if disc unit, record a D in U position.
- Step 3. Construct LOAD field by means of the following:
 - a) Is LOAD WAIT indicator lit? If yes, record an X in L position; if no, leave L position blank.
 - b) Is LOAD NO DATA indicator lit? If yes, record an X in O position; if no, leave O position blank.
 - c) Is LOAD CHECK indicator lit? If yes, record an X in A position; if no, leave A position blank.
 - d) Is LOAD SUBSYSTEM CHECK indicator lit? If yes, record an X in D position; if no, leave D position blank.
- Step 4. Locate corresponding values in SIL formatted list by first matching D1 display value with D1 in list. Then match constructed LSURL field with LSURL column in list. Next match A1 display value with A1 in list, then match A8 display value with A8 in list, etc., ignoring any blank columns. Finally, match constructed LOAD field with LOAD column in list.

NOTE

The control unit and device numbers may appear in the two right-most digits of D8 display. If this occurs, substitute actual site control unit and device numbers in corresponding digit positions of D8 column in list and proceed with matching.

- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5. Then replace specified card(s).

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
	XXTX							503	
	XXTX							504	
	XXTX							505	
	XXTX							506	
	XXTX							507	
	XXTX							508	
	XXTX							509	
	XXTX							511	
	XXTX							512	
	XXTX							513	
	XXTX							515	
	XXTX							516	
	XXTX							518	
	XXTX							600	
	XXTX							601	
	XXTX							602	
	XXTX							603	
	XXTX							604	
	XXTX							605	
	XXTX							606	
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	XXTX							610	
	XXTX							611	
	XXTX							612	
	XXTX							613	
	XXTX							614	
	XXTX							615	
	XXTX							616	
	XXTX							618	
	XXTX							619	
	XXTX							620	
	XXTX							621	
	XXTX							622	
	XXTX							623	
	XXTX							624	
	XXTX							650	
	XXTX							651	
	XXTX							652	
	XXTX							653	
	XXTX							654	
	XXTX							655	
	XXTX							656	
	XXTX							657	
	XXTX							658	
	XXTX							659	
	XXTX							660	
	XXTX							661	

00000	D	X	00000	0C000	18081	00000	00030	612	X
00000	D	X	00002	006C0	18400	10000	08000	CYCLE	616

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	D X	00116	04000	18081	20000		00030	600	XXX
00000	D X	00116	0C000	18081	00000		00030	612	XX
00000	T X	00000				00000		518	X
00000	T X	00000	00000	00040	00000		00000	612	
00000	T X	00000	00000	18080	00000	00000	000E1	509	
00000	T X	00000	00000	18081	00000	00000	000E1	500	X
00000	T X	00000	00000	18081	00000	00000	000E1	518	X
00000	T X	00000	0C000	18081	00000		000E1	612	X
00000	T X	00002	00000	18080	00000	00000	000E0	503	
00000	T X	0003E	18081	0E000	00000	00000	000E1	500	X
00000	T X	00040	00000	18080	00000	00000	000E1	509	
00000	T X	0005A				00000		500	X
00000	T X	0005C	00000	18081	00000	00000	000E1	500	X
00000	T X	0005E	00000	18081	00000	00000	000E1	500	X
00000	T X	00116	00000	18081	00000		000E1	601	XXX
00000	T X	00116	00000	18081	00000	00000	000E0	503	X
00000	T X	00116	00000	18081	00000	00000	000E0	504	X
00000	T X	00116	00000	18081	00000	00000	000E1	503	X
00000	T X	00116	04000	18085	20000		000E1	600	XXX
00000	T X	00116	0C000	18081	00000		000E1	612	XX
00000	T X	00118	00000	18081	00000	00000	000E1	518	X
00000	T X	CYCLE	02482	38C17	02000		00000	617	
00000	XD	00000	00000	00000	00000		00000	601	
00000	XD	00000	00000	00000	00000		00000	612	
00000	XD	00000	00000	00004	00000		20000	612	
00000	XD	00000	00000	00004	00002		00000	606	
00000	XD	00000	00000	00004	00006		00000	606	
00000	XD	00000	00000	00044	00000		00000	612	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00000	00000	00405	00000		1E000	607	X
00000	XD	00000	00000	00405	00000		3E000	607	X
00000	XD	00000	00001	00407	00000		1E000	607	X
00000	XD	00000	0C000	00000	00000		00000	612	
00000	XD	00000	0C000	00004	00000		00000	612	
00000	XD	00002	00000	18080	00000	00000	00030	407	
00000	XD	00110	01CE0	18004	10040		00002	615	XXX
00000	XD	00114	0D040	00000	00000	08000	00000	661	XXX
00000	XD	00116						658	
00000	XD	00116				10000		616	XX
00000	XD	00116	00000		00000	10000	00002	657	XX
00000	XD	00116	00000	0000	00000	10000	00010	656	XX
00000	XD	00116	00000	00000	00000		00000	601	XXX
00000	XD	00116	00000	00000	00000		00000	604	XXX
00000	XD	00116	00000	00000	00000		00000	608	XXX
00000	XD	00116	00000	00000	00000		00200	604	XX
00000	XD	00116	00000	00000	00000		00800	604	XX
00000	XD	00116	00000	00000	00000		01800	604	XX
00000	XD	00116	00000	00000	00000	18000	00000	618	XXX
00000	XD	00116	00000	00000	00001		00000	606	XX
00000	XD	00116	00000	00001	02000		1C430	607	XXX
00000	XD	00116	00000	00003	00000	10000	00038	657	XX
00000	XD	00116	00000	00004	00000		0000	601	XX
00000	XD	00116	00000	00004	00000		00000	601	XXX
00000	XD	00116	00000	00004	00000		00000	608	XXX
00000	XD	00116	00000	00004	00000		00002	601	XX
00000	XD	00116	00000	00004	00000	10000	00030	622	
00000	XD	00116	00000	00004	00000	10000	00030	622	XX
00000	XD	00116	00000	00004	00000	10000	00130	624	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	00000	00004	00000	10000	00130	659	XX
00000	XD	00116	00000	00004	00001		00000	606	XX
00000	XD	00116	00000	00004	000C0		00000	604	XXX
00000	XD	00116	00000	00004	04000		00300	604	XX
00000	XD	00116	00000	00004	04000		00430	604	XX
00000	XD	00116	00000	00005	00000		00030	601	XXX
00000	XD	00116	00000	00006	00000	10000	000B0	656	XX
00000	XD	00116	00000	0000B	00000	10000	00030	658	XX
00000	XD	00116	00000	0000C	00000		00000	608	XX
00000	XD	00116	00000	0000C	00000		00000	611	XX
00000	XD	00116	00000	0000C	00000		00100	611	XX
00000	XD	00116	00000	0000C	00000		00130	601	XX
00000	XD	00116	00000	0000C	00000		00130	606	XX
00000	XD	00116	00000	0000C	00000		00130	615	XX
00000	XD	00116	00000	0000C	00000		00131	611	XX
00000	XD	00116	00000	0000C	00000		001FD	611	XX
00000	XD	00116	00000	0000C	00000	10000	00010	656	
00000	XD	00116	00000	0000C	00000	10000	00010	656	XX
00000	XD	00116	00000	0000C	00000	10000	00020	656	XX
00000	XD	00116	00000	0000C	00000	10000	00030	616	XX
00000	XD	00116	00000	0000C	00000	10000	00030	619	XX
00000	XD	00116	00000	0000C	00000	10000	00030	622	XX
00000	XD	00116	00000	0000C	00000	10000	00030	658	XX
00000	XD	00116	00000	0000C	00000	10000	00038	657	XX
00000	XD	00116	00000	0000C	00000	10000	00070	656	XX
00000	XD	00116	00000	0000C	00000	10000	000B0	656	XX
00000	XD	00116	00000	0000C	00000	10000	00100	619	XX
00000	XD	00116	00000	0000C	00000	10000	00130	622	XX
00000	XD	00116	00000	0000C	00000	10000	00130	659	XX
00000	XD	00116	00000	0000C	00000	10000	0013A	618	XX
00000	XD	00116	00000	0000C	00000	10000	001C0	661	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	00000	0000C	00000	10000	001F3	619	XX
00000	XD	00116	00000	0000C	00000	20000	00100	618	XX
00000	XD	00116	00000	0000C	00000	20000	001F0	618	XX
00000	XD	00116	00000	0000D	00000	10000	00030	658	XXX
00000	XD	00116	00000	04044	00000	10000	00003	657	XX
00000	XD	00116	00000	18001	00000		00030	614	XX
00000	XD	00116	00000	18001	00000	00000	00030	658	XX
00000	XD	00116	00000	18004	00000		00000	611	XX
00000	XD	00116	00000	18004	00000		00002	611	XX
00000	XD	00116	00000	18004	00000		0000E	601	XX
00000	XD	00116	00000	18004	00000		0000E	604	XX
00000	XD	00116	00000	18004	00000		00031	611	XX
00000	XD	00116	00000	18004	00000		00032	611	XX
00000	XD	00116	00000	18004	00000		00102	611	XX
00000	XD	00116	00000	18004	00000	10000	00002	658	XX
00000	XD	00116	00000	18004	00000	10000	00002	619	XX
00000	XD	00116	00000	18004	00000	10000	00002	621	XX
00000	XD	00116	00000	18004	00000	10000	00002	624	XX
00000	XD	00116	00000	18004	00000	10000	00002	657	XX
00000	XD	00116	00000	18004	00000	10000	00002	659	XX
00000	XD	00116	00000	18004	00000	10000	00032	619	XX
00000	XD	00116	00000	18004	00000	10000	00032	624	XX
00000	XD	00116	00000	18004	00900		00002	603	XX
00000	XD	00116	00000	18004	00E80		00002	603	XX
00000	XD	00116	00000	18005	00000		00030	600	XXX
00000	XD	00116	00000	18005	00000	10000	00030	661	XXX
00000	XD	00116	00000	18008	00000	10000	00002	619	XX
00000	XD	00116	00000	18008	00000	10000	00030	650	XXX
00000	XD	00116	00000	1800C	00001		00100	606	XX
00000	XD	00116	00000	1800C	00001		00130	606	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	00000	1800C	00001	10000	00130	659	XX
00000	XD	00116	00000	18044	00000	10000	00006	657	XXX
00000	XD	00116	00000	18044	00000	10000	00012	656	
00000	XD	00116	00000	18044	00000	10000	00022	656	XX
00000	XD	00116	00000	18044	00040	10000	00132	621	XX
00000	XD	00116	00000	18081	00000		00030	614	XX
00000	XD	00116	00000	18401	00000	10000	00030	619	XX
00000	XD	00116	00000	18401	00000	10000	00030	624	XX
00000	XD	00116	00000	18405	00000		00030	605	XXX
00000	XD	00116	00000	18804	00000		00002	611	XX
00000	XD	00116	00000	1880C	00480		00000	603	XX
00000	XD	00116	00000	18C44	00000	10000	00000	657	
00000	XD	00116	00001	00007	04000	10000	00000	624	XXX
00000	XD	00116	00001	20407	00000	10000	00000	624	XXX
00000	XD	00116	00008	00004	00000		00130	600	XX
00000	XD	00116	00100	0000D	16000		0A030	607	XXXX
00000	XD	00116	00100	18004	00000		00150	614	X
00000	XD	00116	00101	00007	00000	10000	00000	624	XXX
00000	XD	00116	00400	00004	00000		00000	601	XXX
00000	XD	00116	00400	20000	02000		00000	606	XXX
00000	XD	00116	00440	00004	10000	10000	00100	658	XX
00000	XD	00116	00440	00C04	10700		00100	603	XX
00000	XD	00116	00440	18004	00000		00000	614	XX
00000	XD	00116	00440	18004	10000		00100	614	XX
00000	XD	00116	00440	18004	10000	10000	00100	658	XX
00000	XD	00116	00440	18008	10000	10000	00100	621	XX
00000	XD	00116	00440	1800C	10001	10000	00130	661	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	00440	18044	10000	10000	00100	658	XX
00000	XD	00116	00440	18044	10000	10000	00101	660	XX
00000	XD	00116	00440	18044	10000	10000	00102	660	XX
00000	XD	00116	00440	18044	10000	10000	00110	660	XX
00000	XD	00116	00440	18044	10000	10000	00120	660	XX
00000	XD	00116	00440	18044	10000	10000	00140	660	XX
00000	XD	00116	00440	18044	10000	10000	00180	660	XX
00000	XD	00116	00440	18080	10000	10000	0013C	622	X
00000	XD	00116	00440	180C4	10000	10000	00104	660	XX
00000	XD	00116	00440	18144	10000	10000	00108	660	XX
00000	XD	00116	00440	18404	10000		00100	614	XX
00000	XD	00116	00440	18404	10000	10000	00100	616	XX
00000	XD	00116	00440	18405	10000		00030	607	XXX
00000	XD	00116	00440	18405	10000		00030	615	XXX
00000	XD	00116	00440	18405	10000		00030	615	XXX
00000	XD	00116	00440	18405	10000	0004A	00030	661	XXX
00000	XD	00116	00440	18405	10000	10000	00030	624	XXX
00000	XD	00116	00440	18C04	10000		00100	613	XX
00000	XD	00116	00440	18C04	10000	10000	00100	658	XX
00000	XD	00116	00440	18C04	10F00		00100	603	XX
00000	XD	00116	00440	18C04	10F00	10000	00100	603	XX
00000	XD	00116	00480	00000	02000		00000	601	XXX
00000	XD	00116	00480	00000	02000		00000	606	XXX
00000	XD	00116	00480	00000	02000	10000	00000	624	XX
00000	XD	00116	00480	00004	00000		00000	602	XXX
00000	XD	00116	00480	00004	00000		00000	604	XXX
00000	XD	00116	00480	00004	00000		00000	608	XXX
00000	XD	00116	00480	00004	02000		00000	602	XX
00000	XD	00116	00480	0000C	02000		00000	602	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	00480	0000C	10000		00130	606	XX
00000	XD	00116	00480	20004	02000	18000	00000	661	XXX
00000	XD	00116	00481	00407	18000	00000	3E400	624	XXXX
00000	XD	00116	004C0	18404	10000		00100	615	XX
00000	XD	00116	004C0	18404	30010		00100	600	X
00000	XD	00116	004C4	18404	10000	10000	00100	659	XX
00000	XD	00116	004C8	18404	10000		00100	615	XX
00000	XD	00116	004C8	18404	10000		20100	600	XX
00000	XD	00116	004CA	00404	10000		20100	613	XX
00000	XD	00116	004CA	00404	10000	10000	20100	621	XX
00000	XD	00116	004CA	00404	10B00		20100	603	XX
00000	XD	00116	00580	0000C	02000		00000	602	XX
00000	XD	00116	00580	0000C	02000		00100	602	XX
00000	XD	00116	00580	0000C	06000	10000	00100	602	XX
00000	XD	00116	00D80	0000C	06000		00100	602	XX
00000	XD	00116	00D80	0000C	1E000		00130	602	XX
00000	XD	00116	01000	00000	00000		00000	601	XXX
00000	XD	00116	01000	00000	00000		00000	608	XXX
00000	XD	00116	01000	00000	00000		00000	612	XXX
00000	XD	00116	01000	00000	00000	18000	02000	607	XXX
00000	XD	00116	01000	00000	00001		00000	606	XXX
00000	XD	00116	01000	00000	000C0	18000	00000	604	XXX
00000	XD	00116	01000	00000	001C0		00000	604	XXX
00000	XD	00116	01000	00001	00000		06000	607	XXXX
00000	XD	00116	01000	00001	00000		0E000	607	XXXX
00000	XD	00116	01000	00004	00000		00000	612	XXX
00000	XD	00116	01000	00004	00000		00800	604	XXX
00000	XD	00116	01000	00004	00000	18000	00000	607	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	01000	00004	00000	18000	00000	620	XXX
00000	XD	00116	01000	00004	00000	18000	00400	607	XXX
00000	XD	00116	01000	00004	00000	18000	02000	607	XXX
00000	XD	00116	01000	00004	00010		00000	605	X X
00000	XD	00116	01000	00004	00180	18000	00000	620	XXX
00000	XD	00116	01000	00004	001C0		00000	604	XXX
00000	XD	00116	01000	00004	001C0	18000	00000	620	XXX
00000	XD	00116	01000	00005	00000	18000	02000	607	XXXX
00000	XD	00116	01000	00005	00000	18000	06000	607	XXXX
00000	XD	00116	01000	00014	00020		00000	605	XXX
00000	XD	00116	01000	00014	00030		00000	605	X X
00000	XD	00116	01400	00000	00000		00000	601	XXX
00000	XD	00116	01400	00000	18000		00000	602	XXX
00000	XD	00116	01400	00000	18000	18000	00000	619	XXX
00000	XD	00116	01400	00004	10000	10000	00002	619	XX
00000	XD	00116	01400	18004	10000		0000E	601	XX
00000	XD	00116	01C00	00000	10000		00030	602	XXX
00000	XD	00116	01C00	00000	14000		00030	602	XXX
00000	XD	00116	01C00	00000	18000	18000	00030	619	XXX
00000	XD	00116	01C00	00004	10000		00130	602	XXX
00000	XD	00116	01C00	00004	14140		00030	604	XXX
00000	XD	00116	01C00	0000C	12000		00130	608	XXX
00000	XD	00116	01C00	0000C	12000	18000	00130	616	XXX
00000	XD	00116	01C00	0000C	12000	18000	00130	624	XXX
00000	XD	00116	01C00	00014	14010		00030	605	X X
00000	XD	00116	01C40	00004	10000		00130	600	XXX
00000	XD	00116	01C40	0000C	12000		00130	615	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	01C40	0000C	12000	18000	00130	623	XXX
00000	XD	00116	01CC0	0000C	10000		00000	606	XXX
00000	XD	00116	01CC0	0000C	10000		00000	612	XXX
00000	XD	00116	01CC0	0000C	11800	18000	00002	620	XXX
00000	XD	00116	01CC0	0000C	12000		00130	606	XXX
00000	XD	00116	01CC0	0000C	12000		00130	612	XXX
00000	XD	00116	01CC0	0000C	12000		00130	614	XXX
00000	XD	00116	01CC0	0000C	12000		00130	615	XXX
00000	XD	00116	01CC0	0000C	12000	18000	00130	659	XXX
00000	XD	00116	01CC0	0000C	12000	18000	00130	661	XXX
00000	XD	00116	01CC0	0000C	12004		00130	612	XXX
00000	XD	00116	01CC0	18004	10040		00002	600	XXX
00000	XD	00116	01CC0	18004	10040		00002	605	XXX
00000	XD	00116	01CC0	18004	10040		00002	615	XXX
00000	XD	00116	01CC0	18004	10040	18000	00002	618	XXX
00000	XD	00116	01CC0	18004	10040	18000	00002	623	XXX
00000	XD	00116	01CC0	18004	10040	18000	00002	624	XXX
00000	XD	00116	01CC0	18004	10040	18000	00002	659	XXX
00000	XD	00116	01CC0	1800C	10040	18000	00002	620	XXX
00000	XD	00116	01CC0	1800C	11C00		00002	603	XXX
00000	XD	00116	01CC1	18404	10000		00100	604	XXX
00000	XD	00116	01CC2	0000C	12000		00130	600	XXX
00000	XD	00116	01CC8	18004	00000	18000	20002	623	XXX
00000	XD	00116	01CC8	18004	10000		00100	607	XXX
00000	XD	00116	01CC8	18004	10040		00002	607	XXX
00000	XD	00116	01CC8	18004	10040		20002	612	XXX
00000	XD	00116	01CC8	18004	10040		20004	615	XXX
00000	XD	00116	01CC8	18004	10040	18000	00002	617	XXX
00000	XD	00116	01CC8	18004	10040	18000	00002	623	XXX
00000	XD	00116	01CC8	18004	10040	18000	00002	624	XXX
00000	XD	00116	01CC8	18044	10000		10502	611	XXX
00000	XD	00116	01CC8	18044	10000		10532	611	XXX
00000	XD	00116	01CC8	18044	10000	18000	10502	658	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XD	00116	01CC8	18044	10000	18000	10502	619	XXX
00000	XD	00116	01CC8	18044	10000	18000	10502	658	XXX
00000	XD	00116	01CC8	18404	10000		00100	604	XXX
00000	XD	00116	01CC8	18404	10000		00100	607	XXX
00000	XD	00116	01CC8	18444	10000		11000	611	XXX
00000	XD	00116	01CD0	0000C	12000	18000	00130	621	XXX
00000	XD	00116	01CD0	18004	10040		00002	615	XXX
00000	XD	00116	01CD0	18004	10040	18000	00002	661	XXX
00000	XD	00116	01CD4	18004	10040	18000	00002	661	
00000	XD	00116	01CD4	18004	10040	18000	00002	661	XXX
00000	XD	00116	01CE0	0000C	10000		00000	608	XXX
00000	XD	00116	01CE0	0000C	10000		00000	611	XXX
00000	XD	00116	01CE0	0000C	10000		00130	606	XXX
00000	XD	00116	01CE0	0000C	10000	10000	00000	616	XX
00000	XD	00116	01CE0	0000C	10000	18000	00000	658	XXX
00000	XD	00116	01CE0	0000C	11000		00000	603	XXX
00000	XD	00116	01CE0	0000C	11000	18000	00000	620	XXX
00000	XD	00116	01CE0	0000C	12004		00130	612	XXX
00000	XD	00116	01CE0	18004	10040		00002	610	XXX
00000	XD	00116	01CF0	18004	10040	18000	00002	659	XXX
00000	XD	00116	01CF0	18004	10040	18000	00002	661	XXX
00000	XD	00116	01D00	00004	10000		00130	602	XXX
00000	XD	00116	01D00	0000C	10000		00100	601	XXX
00000	XD	00116	01D00	0000C	10000		00130	602	XXX
00000	XD	00116	01D00	0000C	12000		00130	606	XXX
00000	XD	00116	01D00	0000C	12000	18000	00130	602	XXX
00000	XD	00116	01D00	0000C	12000	18000	00130	621	XXX
00000	XD	00116	01D80	00004	10000		20000	607	XXX
00000	XD	00116	01D80	00004	10000	18000	20000	621	XXX
00000	XD	00116	01D80	0000C	10004	18000	00000	621	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
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00000	XD	00116	01D80	0000C	12000		00130	615	XXX
00000	XD	00116	01D80	0000C	12000	18000	00130	618	XXX
00000	XD	00116	01D80	0000C	12000	18000	00130	622	XXX
00000	XD	00116	01D80	0000C	12000	18000	00130	623	XXX
00000	XD	00116	01D80	0000C	12000	18000	00130	659	XXX
00000	XD	00116	01D80	0000C	12000	18000	00130	661	XXX
00000	XD	00116	01DC0	0000C	12000		00130	615	XXX
00000	XD	00116	024C0	18400	10000		00199	600	X
00000	XD	00116	024C0	18400	10000	10000	00199	624	X
00000	XD	00116	024C2	18400	10000	10000	00199	619	X
00000	XD	00116	024C2	18404	10000		00199	605	XX
00000	XD	00116	024C2	18404	10000	10000	00199	619	XX
00000	XD	00116	024C2	18410	10000		00199	605	X
00000	XD	00116	024C2	18414	10000		00199	605	XX
00000	XD	00116	024C2	18414	10010		00199	605	X
00000	XD	00116	024C2	18414	10010	10000	00199	622	X
00000	XD	00116	024C2	18454	10010		00000	611	XX
00000	XD	00116	024C2	18454	10010		00190	611	X
00000	XD	00116	024C2	18454	10010		0019D	611	X
00000	XD	00116	024C2	18454	10010	10000	00000	619	X
00000	XD	00116	024C2	18454	10010	10000	00101	658	X
00000	XD	00116	024C2	18454	10010	10000	00199	658	XX
00000	XD	00116	044C8	18400	30018		2000E	605	X
00000	XD	00116	0644B	18007	10020	10000	3E199	624	XXX
00000	XD	00116	064CA	18400	10020		2000E	605	X
00000	XD	00116	064CA	18400	30020		2000E	605	X
00000	XD	00116	08000	00004	00040		00000	604	XXX
00000	XD	00116	09000	00000	00000		00000	618	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
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00000	XD	00116	09000	00000	00000	18000	00000	618	XXX
00000	XD	00116	09000	00004	00000		00000	600	XXX
00000	XD	00116	09CC0	0000C	10800		00002	600	XXX
00000	XD	00116	09CC0	1808C	10000		00002	601	XX
00000	XD	00116	0B000	00000	00000		00000	600	XXX
00000	XD	00116	0C000	18081	00000	10000	00000	607	XX
00000	XD	00116	0C440	18080	10000		0010C	607	X
00000	XD	00116	0C440	18080	C0000	10000	0410C	607	X
00000	XD	00116	0C440	18484	00000		00900	614	XX
00000	XD	00116	0C440	18484	00000	10000	00900	621	XX
00000	XD	00116	0C440	18484	00000	10000	00900	658	XX
00000	XD	00116	0C4C8	18080	10000		0010C	607	X
00000	XD	00116	0C4C8	18080	10000		0010C	614	X
00000	XD	00116	0C4C8	18080	10000		0810C	607	X
00000	XD	00116	0D000	00000	00000	18000	00000	619	XXX
00000	XD	00116	0D000	00004	00000		00000	602	XXX
00000	XD	00116	0D040	00000	00000	18000	00000	661	XXX
00000	XD	00116	0D044	00004	00000		00000	615	XXX
00000	XD	00116	0D400	00004	08000	18000	00000	619	XXX
00000	XD	00116	0D800	00000	00000	18000	00000	619	XXX
00000	XD	00116	0DCC0	0000C	10000		00000	603	XXX
00000	XD	00116	0DCC0	0000C	10000		00002	603	XXX
00000	XD	00116	0DCC0	0000C	10800		00002	603	XXX
00000	XD	00116	0DCC0	0000C	11C00		00002	603	XXX
00000	XD	00116	0DCC0	0000C	11C00		00002	606	XXX
00000	XD	00116	0DCC0	1800C	10000		00002	603	XXX
00000	XD	00116	0DCC0	1800C	10000		00002	614	XXX
00000	XD	00116	0DCC0	1800C	10080		00002	604	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
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00000	XD	00116	0DCC0	1800C	10200		00002	604	XXX
00000	XD	00116	0DCC0	1800C	10400		00002	603	XXX
00000	XD	00116	0DCC0	1820C	10000	18000	00002	614	XXX
00000	XD	00116	0DCC0	1900C	10000		00002	613	XXX
00000	XD	00116	0DCC8	18044	10000	18000	00102	621	XXX
00000	XD	00116	0DCE0	0000C	10000		00000	603	XXX
00000	XD	00116	0DCE0	0000C	10000	18000	00002	620	XXX
00000	XD	00116	0DCE0	1800C	10000	18000	00002	620	XXX
00000	XD	00116	0DCE0	1800C	10200		00002	604	XXX
00000	XD	00116	0DCE0	1800C	10400		00002	609	XXX
00000	XD	00116	0DCE0	1900C	10000		00002	613	XXX
00000	XD	00116	0DCE0	1900C	10000	18000	00002	658	XXX
00000	XD	00116	2B000	00014	00010	18000	00000	600	X X
00000	XD	00116	3B000	00014	00010	18000	00000	600	X X
00000	XD	00116	CYCLE	CYCLE	10000		CYCLE	614	X
00000	XD	0011A	00000	000C0	00000	10000	00020	656	XX
00000	XD	0011C	09000	00000	00000		00000	600	XXX
00000	XD	00440	18404	0E001	10000	00130	00100	604	XX
00000	XT	00000	00000	00000	00000		00000	612	
00000	XT	00000	00000	00000	00000	20000	00000	214	
00000	XT	00000	00000	00004	00002		00000	606	
00000	XT	00000	00000	00004	00006		00000	606	
00000	XT	00000	00000	0000C	00000	10000	00114	502	XX
00000	XT	00000	00000	00044	00000		00000	612	
00000	XT	00000	00000	00405	00000		1E000	607	X
00000	XT	00000	00000	00405	00000		3E000	607	X

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00000	0C000	00000	00000		00000	612	
00000	XT	00000	0C000	00004	00000		00000	612	
00000	XT	00000	0C4C8	18080	10000		0010C	607	X
00000	XT	00001	00000	00000	00000	10000	00000	502	XX
00000	XT	00002				10000		502	XX
00000	XT	00002	00000	00000	00000	10000	00000	502	XX
00000	XT	00002	00000	0000C	00000	10000	00114	502	XX
00000	XT	00002	00000	18080	00000	00000	000E1	407	
00000	XT	00002	00000	18080	00000	00000	000E1	507	
00000	XT	00116				10000		659	XX
00000	XT	00116	00000	00000	00000		00000	601	XXX
00000	XT	00116	00000	00000	00000		00000	604	XXX
00000	XT	00116	00000	00000	00000		00000	608	XXX
00000	XT	00116	00000	00000	00000		00000	618	XXX
00000	XT	00116	00000	00000	00000		00200	604	XX
00000	XT	00116	00000	00000	00000		01800	604	XX
00000	XT	00116	00000	00000	00001		00000	606	XX
00000	XT	00116	00000	00000	04000		004E1	604	XX
00000	XT	00116	00000	00001	02000		1C4E1	607	XXX
00000	XT	00116	00000	00004	00000		00000	601	XXX
00000	XT	00116	00000	00004	00000		00000	608	XXX
00000	XT	00116	00000	00004	00000		00002	601	XX
00000	XT	00116	00000	00004	00000	10000	000E1	622	XX
00000	XT	00116	00000	00004	00000	10000	001E7	624	XX
00000	XT	00116	00000	00004	00001		00000	606	XX
00000	XT	00116	00000	00004	04000		000E1	604	XX
00000	XT	00116	00000	00005	00000		000E1	601	XXX
00000	XT	00116	00000	0000C	00000		00000	608	XX
00000	XT	00116	00000	0000C	00000		00000	611	XX
00000	XT	00116	00000	0000C	00000		000E1	616	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	00000	0000C	00000		00100	611	XX
00000	XT	00116	00000	0000C	00000		00100	618	XX
00000	XT	00116	00000	0000C	00000		001E1	601	XX
00000	XT	00116	00000	0000C	00000		001E1	606	XX
00000	XT	00116	00000	0000C	00000		001E1	615	XX
00000	XT	00116	00000	0000C	00000		001F1	611	XX
00000	XT	00116	00000	0000C	00000		001F1	618	XX
00000	XT	00116	00000	0000C	00000		001FD	611	XX
00000	XT	00116	00000	0000C	00000		001FD	618	XX
00000	XT	00116	00000	0000C	00000	10000	00061	656	XX
00000	XT	00116	00000	0000C	00000	10000	000A1	656	XX
00000	XT	00116	00000	0000C	00000	10000	000C1	624	XX
00000	XT	00116	00000	0000C	00000	10000	000C1	656	XX
00000	XT	00116	00000	0000C	00000	10000	000E1	619	XX
00000	XT	00116	00000	0000C	00000	10000	000E1	622	XX
00000	XT	00116	00000	0000C	00000	10000	000E1	658	XX
00000	XT	00116	00000	0000C	00000	10000	000F1	656	XX
00000	XT	00116	00000	0000C	00000	10000	00100	619	XX
00000	XT	00116	00000	0000C	00000	10000	00114	502	XX
00000	XT	00116	00000	0000C	00000	10000	00160	215	XX
00000	XT	00116	00000	0000C	00000	10000	001A0	215	XX
00000	XT	00116	00000	0000C	00000	10000	001C0	215	XX
00000	XT	00116	00000	0000C	00000	10000	001E1	622	XX
00000	XT	00116	00000	0000C	00000	10000	001E1	659	XX
00000	XT	00116	00000	0000C	00000	10000	001F0	215	XX
00000	XT	00116	00000	0000C	00000	20000	000E1	658	XX
00000	XT	00116	00000	0000C	04000	10000	00100	602	XX
00000	XT	00116	00000	00401	00000		008E1	604	XXX
00000	XT	00116	00000	04004	00000		00002	611	XX
00000	XT	00116	00000	04004	00000		000E3	611	XX
00000	XT	00116	00000	04004	00000	10000	00002	619	XX
00000	XT	00116	00000	04004	00000	10000	00002	621	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	00000	04004	00000	10000	000E3	619	XX
00000	XT	00116	00000	04004	00000	10000	000E3	624	XX
00000	XT	00116	00000	04044	00000	10000	00003	657	XX
00000	XT	00116	00000	04064	00040	10000	001E3	621	XX
00000	XT	00116	00000	18001	00000		000E1	614	XX
00000	XT	00116	00000	18001	00000	00000	000E1	658	XX
00000	XT	00116	00000	18001	00000	10000	000E1	660	XX
00000	XT	00116	00000	18001	00000	10000	000E3	660	XX
00000	XT	00116	00000	18004	00000		00002	611	XX
00000	XT	00116	00000	18004	00000	10000	00002	658	XX
00000	XT	00116	00000	18004	00000	10000	00002	659	XX
00000	XT	00116	00000	18004	00040		00002	615	XX
00000	XT	00116	00000	18004	00040	10000	00002	624	XX
00000	XT	00116	00000	18004	00040	10000	00020	624	XX
00000	XT	00116	00000	18004	00900		00002	603	XX
00000	XT	00116	00000	18005	00000	10000	000E0	657	XXX
00000	XT	00116	00000	18005	00000	10000	000E3	657	XXX
00000	XT	00116	00000	18005	00000	10000	000E5	657	XXX
00000	XT	00116	00000	18005	00000	10000	000E9	657	XXX
00000	XT	00116	00000	18008	00000	10000	000E1	621	XX
00000	XT	00116	00000	1800C	00001		00100	606	XX
00000	XT	00116	00000	1800C	00001		001E1	606	XX
00000	XT	00116	00000	1800C	00001	10000	001E1	659	XX
00000	XT	00116	00000	18044	00000	10000	00006	657	XXX
00000	XT	00116	00000	18044	00000	10000	0000A	657	XX
00000	XT	00116	00000	18044	00000	10000	00022	656	XX
00000	XT	00116	00000	18044	00000	10000	00042	656	XX
00000	XT	00116	00000	18044	00000	10000	00082	656	XX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	00000	18050	00000	10000	000E9	657	
00000	XT	00116	00000	18081	00000		000E1	614	XX
00000	XT	00116	00000	18081	00000	10000	020E1	607	XX
00000	XT	00116	00000	18401	00000	10000	000E1	619	XX
00000	XT	00116	00000	18401	00000	10000	000E1	624	XX
00000	XT	00116	00000	18804	00000		00002	611	XX
00000	XT	00116	00000	1880C	00680		00000	603	XX
00000	XT	00116	00000	18C44	00000	10000	00000	657	XX
00000	XT	00116	00000	1C004	00000		00000	611	XX
00000	XT	00116	00001	00003	04000	10000	00000	624	XXX
00000	XT	00116	00001	00407	00000	10000	00000	624	XXX
00000	XT	00116	00001	18007	00F00		00002	603	XXX
00000	XT	00116	00009	38407	00000	10000	00000	624	XXX
00000	XT	00116	00100	0000D	16000		0A0E1	607	XXXX
00000	XT	00116	00101	00007	00000	10000	00000	624	XXX
00000	XT	00116	00400	00004	00000		00000	601	XXX
00000	XT	00116	00400	20000	02000		00000	606	XXX
00000	XT	00116	00440	1800C	10001	10000	001E1	661	XX
00000	XT	00116	00440	18080	10000	10000	001ED	622	X
00000	XT	00116	00480	00000	02000		00000	601	XXX
00000	XT	00116	00480	00000	02000		00000	606	XXX
00000	XT	00116	00480	00000	02000	10000	00000	624	XX
00000	XT	00116	00480	00000	10000		001E1	606	XX
00000	XT	00116	00480	00004	02000		00000	602	XX
00000	XT	00116	00480	0000C	02000		00000	602	XX
00000	XT	00116	00480	0000C	10000		001E1	606	XX
00000	XT	00116	00480	20004	02000	18000	00000	661	XXX
00000	XT	00116	004C0	1840	00000		00100	614	X

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	004C0	18404	10000		00100	600	XX
00000	XT	00116	004C0	18404	10000	10000	00100	661	XX
00000	XT	00116	004C0	18404	30010		00100	600	X
00000	XT	00116	004C0	CYCLE	10000		CYCLE	614	
00000	XT	00116	004C2	00400	10F00	10000	00100	603	XX
00000	XT	00116	004C2	00404	10000		00100	613	XX
00000	XT	00116	004C2	00404	10000	10000	00100	621	XX
00000	XT	00116	004C2	00404	10000	10000	00100	658	XX
00000	XT	00116	004C2	00404	10B00		00100	603	XX
00000	XT	00116	004C2	00C04	00700		00000	603	XX
00000	XT	00116	004C4	18404	10000	10000	00100	659	XX
00000	XT	00116	004C8	18080	00000	10000	00100	623	X
00000	XT	00116	004C8	18400	10000		00100	607	X
00000	XT	00116	004C8	18400	10000	10000	00100	623	X
00000	XT	00116	004C8	18400	10000	10000	00100	624	X
00000	XT	00116	004C8	18404	10000		00100	615	XX
00000	XT	00116	00580	0000C	02000		00000	602	XX
00000	XT	00116	005C0	0000C	02000		00100	602	XXX
00000	XT	00116	00DC0	0000C	06000		00100	602	XXX
00000	XT	00116	00DC0	0000C	1E000		00100	602	XXX
00000	XT	00116	01000	00000	00000		00000	601	XXX
00000	XT	00116	01000	00000	00000		00000	608	XXX
00000	XT	00116	01000	00000	00000		00000	612	XXX
00000	XT	00116	01000	00000	00000	18000	00000	620	XXX
00000	XT	00116	01000	00000	00001		00000	606	XXX
00000	XT	00116	01000	00000	001C0		00000	604	XXX
00000	XT	00116	01000	00001	00000		06000	607	XXXX
00000	XT	00116	01000	00001	00000		0E000	607	XXXX
00000	XT	00116	01000	00001	00000	18000	06000	607	XXXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	01000	00004	00000		00000	612	XXX
00000	XT	00116	01000	00004	00000		00800	604	XXX
00000	XT	00116	01000	00004	00000	18000	00000	607	XXX
00000	XT	00116	01000	00004	00000	18000	00000	620	XXX
00000	XT	00116	01000	00004	00000	18000	00400	607	XXX
00000	XT	00116	01000	00004	00000	18000	02000	607	XXX
00000	XT	00116	01000	00004	00010		00000	605	X X
00000	XT	00116	01000	00004	000C0		00000	604	XXX
00000	XT	00116	01000	00004	00140		00000	604	XXX
00000	XT	00116	01000	00004	00180	18000	00000	620	XXX
00000	XT	00116	01000	00004	001C0		00000	604	XXX
00000	XT	00116	01000	00005	00000	18000	02000	607	XXXX
00000	XT	00116	01000	00014	00030		00000	605	X X
00000	XT	00116	01001	00407	18000	00000	3E400	624	XXXX
00000	XT	00116	01400	00000	00000		00000	601	XXX
00000	XT	00116	01400	00004	10000	10000	00002	619	XX
00000	XT	00116	014C0	18404	10000		00100	601	XX
00000	XT	00116	01C00	00000	10000		000E1	602	XXX
00000	XT	00116	01C00	00000	14000		000E1	602	XXX
00000	XT	00116	01C00	00000	140C0	18000	000E1	604	XXX
00000	XT	00116	01C00	00000	18000	18000	000E1	619	XXX
00000	XT	00116	01C00	00004	10000		001E1	602	XXX
00000	XT	00116	01C00	00004	14040		000E1	604	XXX
00000	XT	00116	01C00	00004	14140		000E1	604	XXX
00000	XT	00116	01C00	0000C	12000		001E1	608	XXX
00000	XT	00116	01C00	00014	14010		000E1	605	X X
00000	XT	00116	01C08	00044	10000		105E5	600	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	01C40	0000C	12000		001E1	615	XXX
00000	XT	00116	01C40	0000C	12000	18000	001E1	623	XXX
00000	XT	00116	01C40	0000C	12004		001EB	611	XXX
00000	XT	00116	01C40	0000C	12004	18000	001EF	619	XXX
00000	XT	00116	01C60	00004	10000	18000	001E1	661	XXX
00000	XT	00116	01CC0	00004	10000		001E1	600	XXX
00000	XT	00116	01CC0	0000C	00000		001E1	604	XXX
00000	XT	00116	01CC0	0000C	00000		001E1	608	XXX
00000	XT	00116	01CC0	0000C	10000		00000	606	XXX
00000	XT	00116	01CC0	0000C	10000		00000	612	XXX
00000	XT	00116	01CC0	0000C	10000		001E1	602	XXX
00000	XT	00116	01CC0	0000C	12000		001E1	606	XXX
00000	XT	00116	01CC0	0000C	12000		001E1	612	XXX
00000	XT	00116	01CC0	0000C	12000		001E1	614	XXX
00000	XT	00116	01CC0	0000C	12000		001E1	615	XXX
00000	XT	00116	01CC0	0000C	12000	18000	001E1	659	XXX
00000	XT	00116	01CC0	0000C	12000	18000	001E1	661	XXX
00000	XT	00116	01CC0	0000C	12004		001E1	612	XXX
00000	XT	00116	01CC0	18004	10040		00002	600	XXX
00000	XT	00116	01CC0	18004	10040		00002	605	XXX
00000	XT	00116	01CC0	18004	10040		00002	615	XXX
00000	XT	00116	01CC0	18004	10040		00002	618	XXX
00000	XT	00116	01CC0	18004	10040	18000	00002	623	XXX
00000	XT	00116	01CC0	18004	10040	18000	00002	624	XXX
00000	XT	00116	01CC0	18004	10040	18000	00002	659	XXX
00000	XT	00116	01CC0	18004	10040	18000	00002	661	XXX
00000	XT	00116	01CC0	1800C	10040	18000	00002	620	XXX
00000	XT	00116	01CC0	1800C	11C00		00002	603	XXX
00000	XT	00116	01CC0	18404	10000		00100	601	XX
00000	XT	00116	01CC0	18404	10000		00100	604	XX
00000	XT	00116	01CC1	18404	10000		00100	604	XXX
00000	XT	00116	01CC4	18004	10040		00002	615	XXX
00000	XT	00116	01CC8	04064	10000		105E3	611	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	01CC8	18004	10000		00100	607	XXX
00000	XT	00116	01CC8	18004	10040		00002	607	XXX
00000	XT	00116	01CC8	18004	10040		20000	607	XXX
00000	XT	00116	01CC8	18004	10040		20002	612	XXX
00000	XT	00116	01CC8	18004	10040		20004	615	XXX
00000	XT	00116	01CC8	18004	10040	18000	00002	624	XXX
00000	XT	00116	01CC8	18004	10040	18000	10000	621	XXX
00000	XT	00116	01CC8	18004	10040	18000	20002	623	XXX
00000	XT	00116	01CC8	18044	10000		10502	611	XXX
00000	XT	00116	01CC8	18044	10000	18000	10500	658	XXX
00000	XT	00116	01CC8	18044	10000	18000	10502	619	XXX
00000	XT	00116	01CC8	18044	10000	18000	10502	658	XXX
00000	XT	00116	01CC8	18404	10000		00100	604	XXX
00000	XT	00116	01CC8	18404	10000		00100	607	XXX
00000	XT	00116	01CC8	18444	10000		11000	611	XXX
00000	XT	00116	01CC8	1C044	10000	18000	10500	658	XXX
00000	XT	00116	01CD0	0000C	12000	18000	001E1	621	XXX
00000	XT	00116	01CD0	18004	10040		00002	615	XXX
00000	XT	00116	01CD0	18004	10040	18000	00002	661	XXX
00000	XT	00116	01CD0	18004	101C0	18000	00002	620	XXX
00000	XT	00116	01CD4	18004	10040	18000	00002	661	XXX
00000	XT	00116	01CE0	0000C	10000		00000	608	XXX
00000	XT	00116	01CE0	0000C	10000		00000	611	XXX
00000	XT	00116	01CE0	0000C	10000		001E1	606	XXX
00000	XT	00116	01CE0	0000C	10000	18000	00000	658	XXX
00000	XT	00116	01CE0	0000C	10004	18000	00000	621	XXX
00000	XT	00116	01CE0	18004	10040		00002	610	XXX
00000	XT	00116	01CE0	18004	10040		00002	615	XXX
00000	XT	00116	01CE0	18004	10940	18000	00002	603	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	01CE2	0000C	12004		001E1	600	XXX
00000	XT	00116	01CF0	18004	10040	18000	00002	659	XXX
00000	XT	00116	01CF0	18004	10040	18000	00002	661	XXX
00000	XT	00116	01D00	00004	10000		001E1	602	XXX
00000	XT	00116	01D00	0000C	10000		00100	601	XXX
00000	XT	00116	01D00	0000C	10000		001E1	602	XXX
00000	XT	00116	01D00	0000C	12000		001E1	606	XXX
00000	XT	00116	01D00	0000C	12000	00000	001E1	616	XXX
00000	XT	00116	01D00	0000C	12000	18000	001E1	621	XXX
00000	XT	00116	01D00	0000C	12000	18000	001E1	624	XXX
00000	XT	00116	01D00	0000C	12000	18000	00FE1	602	XXX
00000	XT	00116	01D80	0000C	0C000		000C1	608	XXX
00000	XT	00116	01D80	0000C	12000		001E1	606	XXX
00000	XT	00116	01D80	0000C	12000		001E1	615	XXX
00000	XT	00116	01D80	0000C	12000		001E1	618	XXX
00000	XT	00116	01D80	0000C	12000	18000	001E1	622	XXX
00000	XT	00116	01D80	0000C	12000	18000	001E1	623	XXX
00000	XT	00116	01D80	0000C	12000	18000	001E1	659	XXX
00000	XT	00116	01D80	0000C	12000	18000	001E1	661	XXX
00000	XT	00116	01DC0	0000C	12000		001E1	615	XXX
00000	XT	00116	024C0	18400	10000		00199	600	X
00000	XT	00116	024C0	18400	10000	10000	00199	624	X
00000	XT	00116	024C2	18400	10000	10000	00199	619	X
00000	XT	00116	024C2	18400	30000		0000E	605	X
00000	XT	00116	024C2	18404	10000		00199	605	XX
00000	XT	00116	024C2	18404	10000	10000	00199	619	XX
00000	XT	00116	024C2	18404	30000		0000E	605	X
00000	XT	00116	024C2	18410	10000		00199	605	X
00000	XT	00116	024C2	18414	10000		00199	605	XX
00000	XT	00116	024C2	18414	10010		00199	605	X

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	024C2	18414	10010	10000	00199	622	X
00000	XT	00116	024C2	18414	10020		00199	605	XX
00000	XT	00116	024C2	18454	10010		00000	611	XX
00000	XT	00116	024C2	18454	10010		00101	618	X
00000	XT	00116	024C2	18454	10010		00190	611	X
00000	XT	00116	024C2	18454	10010		0019D	611	X
00000	XT	00116	024C2	18454	10010	10000	00000	619	X
00000	XT	00116	024C2	18454	10010	10000	00004	658	X
00000	XT	00116	024C2	18454	10010	10000	00101	658	X
00000	XT	00116	024C2	18454	10010	10000	00199	658	XX
00000	XT	00116	024C2	184C4	10010	10000	00199	658	XX
00000	XT	00116	024C2	18C54	00010	10000	001EE	658	X
00000	XT	00116	044C2	18400	30018		0000E	605	X
00000	XT	00116	044CA	18404	10020		00199	617	XX
00000	XT	00116	09000	00000	00000		00000	617	XXX
00000	XT	00116	09000	00004	00000		00000	600	XXX
00000	XT	00116	09CC0	0000C	10800		00002	600	XXX
00000	XT	00116	09CC0	1808C	10000		00002	601	XX
00000	XT	00116	0B000	00000	00000		00000	600	XXX
00000	XT	00116	0C000	18081	00000	10000	00000	607	XX
00000	XT	00116	0C440	18080	10000		0010C	607	X
00000	XT	00116	0C440	18080	10000	10000	0410C	607	X
00000	XT	00116	0C4C8	18080	10000		0010C	607	X
00000	XT	00116	0C4C8	18080	10000		0010C	614	X
00000	XT	00116	0C4C8	18080	10000		0810C	607	X
00000	XT	00116	0CCE0	1900C	10000	18000	00002	658	XXX
00000	XT	00116	0D000	00000	00000	18000	00000	619	XXX

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	00116	0D000	00004	00000		00000	602	XXX
00000	XT	00116	0D040	00000	00000	18000	00000	661	XXX
00000	XT	00116	0D400	00000	18000		00000	602	XXX
00000	XT	00116	0D400	00000	18000	18000	00000	619	XXX
00000	XT	00116	0D400	00004	08000	18000	00000	619	XXX
00000	XT	00116	0D800	00000	00000	18000	00000	619	XXX
00000	XT	00116	0DCC0	0000C	10000		00000	603	XXX
00000	XT	00116	0DCC0	0000C	10000		00002	603	XXX
00000	XT	00116	0DCC0	0000C	10800		00002	603	XXX
00000	XT	00116	0DCC0	0000C	11800	18000	00002	620	XXX
00000	XT	00116	0DCC0	0000C	11C00		00002	603	XXX
00000	XT	00116	0DCC0	0000C	11C00		00002	606	XXX
00000	XT	00116	0DCC0	1800C	10000		00002	603	XXX
00000	XT	00116	0DCC0	1800C	10000		00002	614	XXX
00000	XT	00116	0DCC0	1800C	10000	18000	00002	620	XXX
00000	XT	00116	0DCC0	1800C	10080		00002	604	XXX
00000	XT	00116	0DCC0	1800C	10200		00002	604	XXX
00000	XT	00116	0DCC0	1800C	10400		00002	603	XXX
00000	XT	00116	0DCC0	1800C	10400		00002	609	XXX
00000	XT	00116	0DCC0	1820C	10000	18000	00002	614	XXX
00000	XT	00116	0DCC0	1900C	10000		00002	613	XXX
00000	XT	00116	0DCC8	18044	10000	18000	00102	621	XXX
00000	XT	00116	0DCE0	0000C	10000	18000	00002	620	
00000	XT	00116	0DCE0	0000C	10000	18000	00002	620	XXX
00000	XT	00116	0DCE0	0000C	11000		00000	603	XXX
00000	XT	00116	0DCE0	0000C	11000	18000	00000	620	XXX
00000	XT	00116	0DCE0	1800C	10200		00002	604	XXX
00000	XT	00116	0DCE0	1900C	10000		00002	613	XXX
00000	XT	00116	3B000	00014	00010	18000	00000	600	X X

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00000	XT	0011C	09000	00000	00000		00000	600	XXX
00000	XT	20116	00000	18081	00000	10000	000E0	503	XX
00000	XT	2D000	00000	00014	00010	18000	00000	600	X X
00002	T X	00002	00000	18080	00000	00000	000E1	503	
00002	T X	0001E	00000	18081	00000	00000	000E0	515	X
00002	T X	00102	00000	18080	00000	00000	000E1	509	
00002	XT	00000	00000	18081	00000	00000	000E1	500	X
00002	XT	00002	00000	00000	00000	10000	00000	500	XX
00002	XT	00002	00000	0000C	00000	10000	00100	500	XX
00003	D X	00003	00000	18080	00000	08100	00030	407	
00003	T X	00003	00000	18080	00000	08100	000E0	503	
00003	T X	00003	00000	18080	00000	08100	000E1	407	
00004	T X	00002	00000	18080	00000	00000	000E0	505	
00004	T X	00002	00000	18080	00000	00000	000E1	401	
00004	T X	00002	00000	18080	00000	00000	000E1	409	
00004	T X	00002	00000	18080	00000	00000	000E1	508	
00004	T X	00002	00000	18081	00000	00000	000E0	504	X
00004	T X	00082	00000	18080	00000	00100	000E0	515	
00004	T X	00C52	00000	18080	00000	00000	000E1	518	
00004	XD	00002	00000	18080	00000		00030	612	
00004	XD	00002	00000	18080	00000		00030	615	
00004	XD	00002	00000	18080	00000	00000	00030	405	
00004	XD	00002	00000	18080	00000	00000	00030	651	
00004	XD	00002	00000	18100	00000	00000	00030	660	
00004	XD	00002	00000	18100	00000	00000	00031	657	X
00004	XD	00002	00000	28080	00000	00000	00030	406	
00004	XD	00002	004C0	18082	00000		00000	612	
00004	XD	01002	00000	18080	00000	00000	00030	650	
00004	XD	02002	00000	18080	00000	00000	00030	650	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00004	XD	02F9E	00000	18080	00100	000E1		406	
00004	XD	08002	00000	18080	00000	00000	00030	650	
00004	XD	0835E	00000	18080	20000	00000	00030	616	
00004	XD	097FE	00000	18080	10000	00000	00030	622	
00004	XD	09DDE	00000	18080	20000	00000	00030	622	
00004	XD	0FDDE	00000	18080	20000	00000	00030	622	
00004	XD	121DE	00000	18080	20000	00000	00030	622	
00004	XD	CYCLE	00000	18080	00000	00000	00030	654	
00004	XD	CYCLE	00000	18080	20000		00030	600	
00004	XD	CYCLE	00000	18080	20000	00000	00030	608	
00004	XD	CYCLE	00000	18080	20000	00000	00030	617	
00004	XT	00002	00000	18008	00000	00000	000E0	213	
00004	XT	00002	00000	18080	00000		000E1	612	
00004	XT	00002	00000	18080	00000		000E1	615	
00004	XT	00002	00000	18080	00000	00000	000E0	209	
00004	XT	00002	00000	18080	00000	00000	000E0	210	
00004	XT	00002	00000	18080	00000	00000	000E0	211	
00004	XT	00002	00000	18080	00000	00000	000E0	504	
00004	XT	00002	00000	18080	00000	00000	000E0	505	
00004	XT	00002	00000	18080	00000	00000	000E0	515	
00004	XT	00002	00000	18080	00000	00000	000E0	515	X
00004	XT	00002	00000	18080	00000	00000	000E1	405	
00004	XT	00002	00000	18080	00000	00000	000E1	406	
00004	XT	00002	00000	18080	00000	00000	000E1	419	
00004	XT	00002	00000	18080	00000	00000	000E1	507	
00004	XT	00002	00000	18080	00000	00000	000E1	512	
00004	XT	00002	00000	18080	00000	00000	000E1	651	
00004	XT	00002	00000	18080	20000		000C1	617	
00004	XT	00002	00000	18081	00000	00000	000E0	515	X
00004	XT	00002	00000	18081	00000	00000	000E1	503	X
00004	XT	00002	00000	18081	00000	00000	000E1	508	X
00004	XT	00002	00000	18081	00000	00000	000E1	518	X
00004	XT	00002	00000	18081	00000	00000	000E1	658	X
00004	XT	00002	00000	18088	00000		000E1	616	
00004	XT	00002	00000	18100	00000	00000	000E1	660	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00004	XT	00002	00000	19100	00000	00000	000E1	657	X
00004	XT	00002	004C0	18082	00000		00000	612	
00004	XT	00190	00000	18080	00000	00000	000E1	651	
00004	XT	01002	00000	18080	00000	00000	00030	650	
00004	XT	02002	00000	18080	00000	00000	000E1	650	
00004	XT	02BDE	00000	18080	20000	00000	000E1	622	
00004	XT	02F9E	00000	18080	00100	000E1		406	
00004	XT	033DE	00000	18080	10000	00000	000E1	622	
00004	XT	05EDE	00000	18080	20000	00000	000E1	622	
00004	XT	0C9DE	00000	18080	20000	00000	000E1	622	
00004	XT	0FF02	00000	18080	00000	00000	000E1	508	
00004	XT	14EFE	00000	1A080	00000	00000	000E1	658	
00004	XT	CYCLE	00000	18080	20000	00000	000E1	608	
00004	XT	CYCLE	00000	18084	20000		000E1	600	
00005	XD	00002	00000	18080	00000	00000	00030	655	
00005	XD	CYCLE	00000	18080	00000	00000	00030	651	
00005	XD	CYCLE	00000	18080	00000	00000	00030	652	
00005	XD	CYCLE	00000	18080	00000	00000	00030	655	
00005	XT	00002	00000	18009	00000	00000	000E1	655	
00005	XT	00002	00000	18080	00000	00000	000E1	507	
00005	XT	00002	00000	18080	00000	00000	000E1	652	
00005	XT	00002	00000	18080	00000	00000	000E1	653	
00005	XT	00002	00000	18080	00000	00000	000E1	655	
00005	XT	CYCLE	00000	18080	00000	00000	000E1	508	
00005	XT	CYCLE	00000	18080	00000	00000	000E1	652	
00005	XT	CYCLE	00000	18080	00000	00000	000E1	655	
00006	T X	00002	00000	18080	00000	00000	000E1	413	
00006	T X	00003	00000	18081	00000	00000	000E1	518	X
00006	T X	0000A	00000	18080	00000		000E1	610	
00008	T X	00006	00000	18080	00000	00000	000E1	500	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00009	XD	00002	00000	18080	00000	00000	00030	653	
0000D	XD	00002	00000	18080	00000	00000	00030	653	
0000D	XD	CYCLE	00000	18080	00000	00000	00030	653	
0000D	XT	00002	00000	18080	00000	00000	000E1	653	
00011	T X	CYCLE	00000	18080	00000	00000	000E1	653	
00015	XD	00190	00000	18080	00000	00000	00030	653	
00015	XD	CYCLE	00000	18080	00000	00000	00030	653	
00015	XT	CYCLE	00000	18080	00000	00000	000E1	652	
00024	XD	CYCLE	00000	18080	00000	00000	00030	652	
0002E	T X	CYCLE	00000	18080	00000	00000	000E1	506	
0002E	XD	CYCLE	00000	18080	00000	00000	00030	651	
0002E	XT	CYCLE	00000	18080	00000	00000	000E1	651	
00045	XD	00002	00000	18080	00000	00000	00030	652	
00045	XD	CYCLE	00000	18080	00000	00000	00030	652	
00045	XT	CYCLE	00000	18080	00000	00000	000E1	652	
00054	XT	CYCLE	00000	18080	00000	00000	000E1	651	
00064	XT	CYCLE	00000	18080	00000	00000	000E1	654	
00080	T X	00182	00000	18080	00000	00000	000E1	509	X
00080	XT	00002	00000	18080	00000	00000	000E1	507	
00084	XD	00002	00000	18080	00000	00000	00030	651	
00084	XT	00002	00000	18080	00000	00000	000E1	651	
00084	XT	CYCLE	00000	18080	00000	00000	000E1	652	
00085	XD	CYCLE	00000	18080	00000	00000	00030	652	
0009C	T X	0009A	00000	18081	00000	00000	000E1	500	X
000B8	XD	00002	00000	18080	00000	00000	00030	651	
000B8	XT	00002	00000	18080	00000	00000	000E1	651	
000C2	T X	000C2	00000	18080	00000	00000	000E0	505	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
000CE	D X	0019E	00000	18080	20000	00000	00030	617	
000CE	T X	00002	00000	18080	00000	00000	000E1	203	
000D2	T X	000D2	00000	18080	00000	00000	000E0	505	
000EE	T X	00002	00000	18080	00000	00000	000E1	203	
000EE	T X	CYCLE	00000	18080	00000	00000	000E1	203	
00100	XD	055DE	00000	18080	20000	00000	00030	617	
00100	XD	CYCLE				00000		617	
00104	D X	00102	00000	18081	00000	00000	00030	407	X
00104	T X	00102	00000	18081	00000	00000	000E1	407	X
00104	T X	00102	00000	18081	00000	00000	000E1	408	X
00104	T X	00102	00000	18081	00000	00000	000E1	409	X
00108	XD	00002	00000	18080	00000		00030	609	
00108	XD	00002	00000	18080	00000	00000	00030	651	
00108	XT	00002	00000	18080	00000		000E1	609	
00108	XT	00002	00000	18080	00000	00000	000E1	651	
00108	XT	00002	00000	18080	00000	00000	000E1	652	
00108	XT	00002	00000	18080	00000	00000	000E1	654	
00108	XT	00002	00000	18080	20000		000E1	617	
0010C	T X	0010A	00000	18081	00000	00000	000E1	401	X
00118	T X	00116	00000	18081	00000	00000	000E1	500	X
00198	XD	00002	00000	18080	00000		00030	609	
00198	XD	00002	00000	18080	00000	00000	00030	620	
00198	XD	00002	00000	18080	00000	00000	00030	652	
00198	XD	00002	00000	18080	00000	00000	00030	653	
00198	XD	00002	00000	18080	00000	00000	00030	655	
00198	XD	00002	00400	18C04	10000		00000	614	X
00198	XD	10002	00000	18080	00000	00000	00030	652	
00198	XD	CYCLE	00000	18080	00000	00000	00030	653	
00198	XT	00002	00000	18080	00000		000E1	609	
00198	XT	00002	00000	18080	00000	00000	000E1	620	
00198	XT	00002	00000	18080	00000	00000	000E1	652	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00198	XT	00002	00000	18080	00000	00000	000E1	653	
00198	XT	00002	00400	18C04	10000		00000	614	X
00198	XT	00092	00000	18080	00000	00000	000E1	651	
00198	XT	10002	00000	18080	00000	00000	000E1	652	
00198	XT	CYCLE	00000	18080	00000	00000	000E1	655	
0019C	XD	00002	00000	18080	00000	00000	00030	652	
0019C	XD	CYCLE	00000	18080	00000	00000	00030	653	
0019C	XT	CYCLE	00000	18080	00000	00000	000E1	653	
001B0	XD	001DA	00000	18080	00000	00000	00030	653	
001B8	XD	00002	00000	18080	00000	00000	00030	617	
001B8	XD	00002	00000	18080	20000	00000	00030	617	
001B8	XD	00002	00000	1808C		00000	00100	616	
001B8	XT	00002	00000	18081	00000	00000	000E1	503	X
001B8	XT	00082	00000	18080	00000	00000	000E0	211	
001B8	XT	00102	00000	18080	00000	00000	000E0	210	
001B9	XD	00002	00000	18080	00000	00000	00030	655	
001BC	T X	001FA	00000	18080	00000	00000	000E0	213	
001C0	XD	00002				00000		616	
001C0	XD	00002				00000		652	
001C0	XD	00002	00000	18080	20000	00000	00030	616	
001C0	XD	00002	00000	18080	20000	00000	00030	655	
001C0	XT	00012	00000	0000C	00000	10000	001C0	504	XX
001E2	T X	001C2	00000	18080	00000	00000	000E0	511	
001E2	T X	001E2	00000	18080	00000	00000	000E0	511	
001E3	T X	001E3	00000	18080	00000	00000	000E1	203	
001E3	T X	001E3	00000	18080	00000	00000	000E1	403	
001E3	T X	001E3	00000	18080	00000	00000	000E1	404	
001E4	T X	001A3	00000	18080	00000	00000	000E1	406	
001E4	T X	001C2	0EFDE	18080	00000	00000	000E0	516	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
001E4	T X	001E1	00000	18080	00000	00000	000E0	505	
001E4	T X	001E2	00000	18080	00000	00000	000E0	516	
001E4	T X	001E3	00000	18080	00000	00000	000E1	402	
001EE	T X	CYCLE	00000	18080	00000	00000	000E1	403	
001F0	T X	0019A	00000	18080	00000	00000	000E0	515	
001F0	XD	CYCLE	00000	18080	20000		00030	608	
001F0	XT	00002	00000	18080	00000	00100	000E0	504	
001F4	T X	001AE	00000	18081	00000	00000	000E0	515	X
001F4	XD	001AC	00000	18080	00000	00000	00030	406	
001F8	T X	001CA	00000	18080	00000	00000	000E0	515	
001F8	XD	00002	00000	18080	00000	00000	00030	653	
001FF	T X	CYCLE	00000	18080	00000	00000	000E1	403	
00211	T X	00A8C	00000	18080	00000	00000	000E0	210	
00269	XD	CYCLE	00000	18080	00000	00000	00030	653	
00278	T X	00258	00000	18080	00000	00000	000E1	508	
00306	T X	05F16	00000	18080	00000	00000	000E0	505	
00357	T X	00102	00000	18081	00000	00000	000E1	409	X
00378	XD	00002	00000	18080	00000	00000	00030	652	
003CE	T X	CYCLE	00000	18080	00000	00000	000E1	506	
00484	XT	00002	00000	18080	00000	00000	000E0	211	
0048C	XD	00012	00000	18080	00000	00000	00030	652	
0048C	XD	00082	00000	18080	00000	00000	00030	652	
0048C	XT	00002				00000		211	
0048C	XT	00002	00000	18080	00000	00000	000E0	211	
0048C	XT	00012	00000	18080	00000	00000	000E1	652	
0048C	XT	00082	00000	18080	00000	00000	000E1	652	
00490	XD	00002	00000	1808C	00000	00000	00010	655	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00504	XD	00102	00000	18080	00000	00000	00030	651	
00504	XT	00002				00000		210	
00504	XT	00102	00000	18080	00000	00000	000E1	651	
00600	XT	000F2	00000	18080	00000	00000	000E1	404	
00600	XT	000F2	00000	18080	00000	00000	000E1	415	
007FE	T X	007DE	00000	00000	00000	00000	00000	506	
007FE	T X	007DE	00000	18080	00000	00000	000E1	506	
00854	XT	00002	00000	18080	00000	00000	000E0	504	
00864	XT	00002	00000	18080	00000	00000	000E1	508	
00872	XD	CYCLE	00000	18080	00000		00030	601	
00872	XT	CYCLE	00000	18080	00000		000E1	601	
008E6	XT	03802	00000	18081	00000	00000	000E1	503	X
00988	T X	00986	00000	18080	00000	00000	000E1	401	
00994	T X	00992	00000	18080	00000	00000	000E1	409	
009B6	XD	00002	00000	18080	00000		00030	602	
009B6	XD	00002	00000	18080	00000		00030	611	
009B6	XT	00002	00000	18080	00000		000E1	602	
009B6	XT	00002	00000	18080	00000		000E1	611	
00AA4	XT	00002				00000		651	X
00AB6	XD	00002				00000		651	
00AE0	XD	00002	00000	18080	00000		00030	601	
00AE0	XD	00002	00000	18080	20000	00000	00030	617	
00AE0	XD	CYCLE	00000	18080	00000	00000	00030	618	
00AE0	XD	CYCLE	00000	18080	20000	00000	00030	618	
00B7E	T X	00B0A	00000	18080	00000	00000	000E0	209	
00C04	XT	00002				00000		209	
00C04	XT	00002				00000		210	
00C68	XT	00002	00000	18080	00000	00000	000E1	652	
00C68	XT	00002	00000	18080	00000	00000	000E1	655	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00C78	XD	CYCLE	00000	18080	00000	00000	00030	652	
00C7E	XD	00802	00000	18080	00000	00000	00030	651	
00C7E	XT	00802	00000	18080	00000	00000	000E1	651	
00C7E	XT	0080A	00000	18080	00000	00000	000E9	660	
00C82	XD	CYCLE	00000	18080	00000	00000	00030	654	
00F04	X D X	00002	01C00	04084	10000		0010C	601	X
00F04	X T X	00002	01C00	04084	10000		0010C	601	X
00F06	X D X	00F06	0C401	04084	10000		00804	602	
00F08	D X	00F06	00000	18080	00000	00000	00030	654	
00F08	D X	00F06	00000	18080	00000	00000	00030	655	
00F08	D X	00F06	00000	18080	00000	00100	00030	617	
00F08	T X	00F06	00000	18080	00000	00000	000E0	209	
00F08	T X	00F06	00000	18080	00000	00000	000E1	203	
00F08	X D X	00000				00000		616	
00F08	X D X	00000	0C401	04084	00000		00804	602	
00F08	X D X	00000	0CCC0	18A8C	10000		00100	614	
00F08	X D X	00000	0CCC0	1908C	10200		00008	603	
00F08	X D X	00F04	0CCE0	1828C	10200		00106	614	
00F08	X D X	00F06				00000		607	
00F08	X D X	00F06				00000		608	
00F08	X D X	00F06				00000		616	
00F08	X D X	00F06				00000		621	
00F08	X D X	00F06				00000		624	
00F08	X D X	00F06				00000		650	
00F08	X D X	00F06				00000		651	
00F08	X D X	00F06				00000		653	
00F08	X D X	00F06				00000		654	
00F08	X D X	00F06				00000		656	
00F08	X D X	00F06				00000		657	
00F08	X D X	00F06				00000		658	
00F08	X D X	00F06				00000		659	
00F08	X D X	00F06	00000	18C04	00000		00100	610	
00F08	X D X	00F06	00000	18C04	00000	00000	00100	651	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
00F08	X	D	X	00F06	00401	04084	00000	00004	612
00F08	X	D	X	00F06	00401	0408C	10000	00004	611
00F08	X	D	X	00F06	00401	04094	00010	00100	605
00F08	X	D	X	00F06	004C0	04104	10000	00008	614
00F08	X	D	X	00F06	004C0	04104	10000	00008	615
00F08	X	D	X	00F06	004C0	04404	30010	00000	608
00F08	X	D	X	00F06	004C0	1C404	30010	00000	613
00F08	X	D	X	00F06	004C0	3C404	30010	00000	613
00F08	X	D	X	00F06	004C2	00404	10000	00100	613
00F08	X	D	X	00F06	01C40	04084	10000	0030C	604
00F08	X	D	X	00F06	0C401	04084	00000	00004	604
00F08	X	D	X	00F06	104C2	04404	10000	00100	605
00F08	X	D	X	00F06	104C2	04404	10000	00100	612
00F08	X	D	X	00F06	104C2	04414	10000	00100	605
00F08	X	D	X	00F06	124C0	04400	10000	00100	600
00F08	X	D	X	00F06	324C0	04400	10000	00100	605
00F08	X	T	X	00F06			00000	213	
00F08	X	T	X	00F06			00000	401	
00F08	X	T	X	00F06			00000	402	
00F08	X	T	X	00F06			00000	608	
00F08	X	T	X	00F06			00000	651	
00F08	X	T	X	00F06			00000	652	
00F08	X	T	X	00F06			00000	653	
00F08	X	T	X	00F06			00000	657	
00F08	X	T	X	00F06			00000	658	
00F08	X	T	X	00F06			00000	203	X
00F08	X	T	X	00F06			00000	403	X
00F08	X	T	X	00F06			00000	506	X
00F08	X	T	X	00F06			00000	508	X
00F08	X	T	X	00F06	00000	04004	00000	00002	614
00F08	X	T	X	00F06	00000	04004	00000	00000	00002 515
00F08	X	T	X	00F06	00000	18004	00000	00002	618
00F08	X	T	X	00F06	00000	18080	00000	00000	000E1 503
00F08	X	T	X	00F06	00000	18080	20000	00000	000E1 502

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD	
00F08	X T X	00F06	00000	18081	20000	00000	000E1	509		X
00F08	X T X	00F06	00000	18081	20000	00000	000E1	510		X
00F08	X T X	00F06	004C0	04084	10000	00000	0010C	616		
00F08	X T X	00F06	004C0	18404	30000	00000	CYCLE	214		
00F08	X T X	00F06	004C0	1C414	30010		00000	613		
00F08	X T X	00F06	01C40	04084	10000		0030C	604		
00F08	XXT	00F06				00000		506		X
00F18	XD	CYCLE	00000	18080	00000	00000	00030	654		
00F18	XT	00002	00000	18080	00000	00000	000E1	654		
00F1E	XD	CYCLE	00000	18080	00000	00000	00030	655		
00FCC	T X	00F9E	00000	18080	00000	00000	000E1	402		
0100A	XT	00002	00000	18080	00000	00000	000E1	653		
01046	XT	00002	00000	18080	00000	00000	000E0	209		
01070	XD	00202	00000	18080	00000	00000	00030	651		
01070	XT	00202	00000	18080	00000	00000	000E1	651		
0131C	XT	00002	00000	18080	20000	00000	000E0	210		
01404	XT	00002				00000		209		
01404	XT	01002				00000		209		
01611	XT	00FDE	00000	18080	00000		000E1	617		
01611	XT	045DE	00000	18080	00000		000E1	617		
01FCF	T X	CYCLE	00000	18080	00000	00000	000E1	507		
023B4	T X	02393	00000	18080	00000	00000	000E1	518		
02404	XT	00002				00000		209		
0246C	XT	04042	00000	18080	00000	00000	000E1	660		
0316C	XD	00001	00000	18080	00000		00030	601		
0316C	XD	00002	00000	18080	00000	00000	00030	655		
0316C	XD	00002	00000	1A080	00030			613		

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
0316C	XT	00001	00000	18080	00000		000E1	601	
0316C	XT	00002	00000	1A080	00000		000E1	613	
03800	T X	00058	00000	18081	00000	00000	000E1	500	X
03800	T X	0005A	00000	18081	00000	00000	000E1	500	X
03800	T X	0005E	00000	18081	00000	00000	000E1	419	X
03800	T X	000DE	00000	18081	00000	00000	000E1	503	X
0380E	XT	00002	00000	18080	00000	00000	000E1	403	
0380E	XT	00002	00000	18080	00000	00000	000E1	508	
0381C	XT	00002	00000	18080	00000	00000	000E0	503	
0381C	XT	00002	00000	18081	00000	00000	000E0	504	X
03ACA	T X	03A9E	00000	18080	00000	00000	000E0	503	
03AFD	T X	03AFB	00000	18081	00000	00000	000E1	500	X
03BCE	T X	03B9E	00000	18080	00000	00000	000E1	518	
04148	T X	00148	00000	18080	00000	00000	000E1	503	
04404	XT	00002				00000		209	
04FCA	T X	04F9E	00000	18080	00000	00000	000E0	209	
050D0	XT	00002	00000	18080	00000	00000	000E0	504	
050D0	XT	00002	00000	18080	00000	00000	000E0	517	
050D0	XT	00002	00000	18080	00000	00000	000E1	507	
050D0	XT	00002	00000	18080	00000	00000	000E1	509	
050D4	XD	CYCLE	00000	18080	00000		00030	601	
050D4	XT	CYCLE	00000	18080	00000		000E1	601	
05186	XD	CYCLE	00000	18080	20000		00030	608	
06974	XT	00002	00000	18080	00000	00000	000E0	505	
07A49	T X	03A5F	00000	18081	00000	00000	000E1	500	X
07FCB	T X	CYCLE	00000	18081	00000	00000	000E1	503	X
08404	XT	00002				00000		209	
0993C	XT	00002	00000	18080	00000	00000	000E0	210	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
0993C	XT	00002	00000	18080	00000	00000	000E1	509	
0993C	XT	0D9F2	00000	18080	00000	00000	000E0	515	
0B000	T X	0B002	00000	18080	00000	00000	000E1	507	
0B000	XT	00002	00000	18080	00000	00000	000E0	511	
0B000	XT	00002	00000	18080	00000	00000	000E1	507	
0B0C0	T X	0B0CE	00000	18080	00000	00000	000E1	507	
0F44E	T X	0F50A	00000	18080	00000	00000	000E0	209	
0F612	XD	00196	00000	18080	00000		00030	610	
0F612	XT	00196	00000	18080	00000		000E1	610	
14648	T X	0010A	00000	18080	00000	00000	000E1	508	
CYCLE	D X		00000	00084	00000	CYCLE	00044	651	
CYCLE	D X	0010A	00000	18080	00000	00000	00030	651	
CYCLE	D X	0019A	00000	18080	00000		00030	610	
CYCLE	D X	0019A	00000	18080	00000		00030	611	
CYCLE	D X	0019E	00000	18080	00000		00030	610	
CYCLE	D X	0079E	00000	18080	00000		00030	610	
CYCLE	D X	1FF9E	00000	18080	00000	00000	00030	622	
CYCLE	D X	1FF9E	00000	18080	20000	00000	00030	623	
CYCLE	D X	CYCLE	00000	15080	00000	00000	00030	655	
CYCLE	D X	CYCLE	00000	18080	00000		00030	609	
CYCLE	D X	CYCLE	00000	18080	00000		00030	610	
CYCLE	D X	CYCLE	00000	18080	00000	00000	00030	405	
CYCLE	D X	CYCLE	00000	18080	00000	00000	00030	406	
CYCLE	D X	CYCLE	00000	18080	00000	00000	00030	650	
CYCLE	D X	CYCLE	00000	18080	00000	00000	00030	651	
CYCLE	D X	CYCLE	00000	18080	00000	00000	00030	653	
CYCLE	D X	CYCLE	00000	18080	00000	00000	00030	655	
CYCLE	D X	CYCLE	00000	18080	20000	00000	00030	617	
CYCLE	D X	CYCLE	00000	18080	20040		00030	604	
CYCLE	T X	00000	00000	18080	00000	00000	000E0	209	

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
CYCLE	T X	00106	00000	18080	00000	00000	000E1	409	
CYCLE	T X	0010A	00000	18080	00000	00000	000E1	651	
CYCLE	T X	0019A	00000	18080	00000		000E1	610	
CYCLE	T X	0019A	00000	18080	00000		000E1	611	
CYCLE	T X	02A8A	00000	18080	000C2	20000	000E1	500	
CYCLE	T X	1FF9E	00000	18080	00000	00000	000E0	515	
CYCLE	T X	1FF9E	00000	18080	00000	00000	000E1	512	
CYCLE	T X	1FF9E	00000	18080	00000	00000	000E1	622	
CYCLE	T X	1FF9E	00000	18080	20000	00000	000E1	623	
CYCLE	T X	1FF9E	00000	18081	00000	00000	000E1	512	
CYCLE	T X	CYCLE	00000	18080	00000		000E1	600	
CYCLE	T X	CYCLE	00000	18080	00000		000E1	609	
CYCLE	T X	CYCLE	00000	18080	00000		000E1	610	
CYCLE	T X	CYCLE	00000	18080	00000		000E1	617	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E0	209	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E0	210	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E0	213	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E0	503	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E0	505	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	203	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	402	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	403	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	405	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	406	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	409	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	413	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	417	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	419	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	500	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	502	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	503	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	506	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	508	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	650	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	651	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	653	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	654	
CYCLE	T X	CYCLE	00000	18080	00000	00000	000E1	660	
CYCLE	T X	CYCLE	00000	18080	20040		000E1	604	
CYCLE	T X	CYCLE	00000	18081	00000	00000	000E0	503	X

D1	LSURL	A1	A8	B8	C8	D5	D8	FIG	LOAD
CYCLE	T X	CYCLE	00000	18081	00000	00000	000E1	502	X
CYCLE	T X	CYCLE	00000	1808C	00000	00000	0008F	209	
CYCLE	T X	CYCLE	00000	1808C	00000	00000	00100	209	
CYCLE	XD	CYCLE	00000	18080	00000		00030	609	
CYCLE	XD	CYCLE	00000	18080	00000	00000	00030	617	
CYCLE	XT	CYCLE	00000	00000	00000	20000	00000	500	
CYCLE	XT	CYCLE	00000	00004	00000	20000	00000	500	
CYCLE	XT	CYCLE	00000	18080	00000		000E1	609	

5-3. S2L FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions that cause the following conditions:

- 1) a load failure condition when loading from a device connected to Selector Channel 2, or
- 2) an error loop condition with the D1 display equal to 00F04 through 00F08 after a successful load from a device connected to Selector Channel 2.

To utilize this data perform the following steps:

- Step 1. Record hexadecimal values observed in D1, A1, A7, B7, C7, D5, and D7 displays.
- Step 2. Construct LSURL field by means of the following:
 - a) Did load attempt succeed? If yes, record an X in left-most L position; if no, leave left-most L position blank.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) What loading device was used? If tape unit, record a T in U position; if disc unit, record a D in U position.
- Step 3. Construct LOAD field by means of the following:
 - a) Is LOAD WAIT indicator lit? If yes, record an X in L position; if no, leave L position blank.
 - b) Is LOAD NO DATA indicator lit? If yes, record an X in O position; if no, leave O position blank.
 - c) Is LOAD CHECK indicator lit? If yes, record an X in A position; if no, leave A position blank.
 - d) Is LOAD SUBSYSTEM CHECK indicator lit? If yes, record an X in D position; if no, leave D position blank.
- Step 4. Locate corresponding values in S2L formatted list by first matching D1 display value with D1 in list. Then match constructed LSURL field with LSURL column in list. Next match A1 display value with A1 in list, then match A7 display value with A7 in list, etc., ignoring any blank columns. Finally, match constructed LOAD field with LOAD column in list.

NOTE

The control unit and device numbers may appear in two right-most digits of D8 display. If this occurs, substitute actual site control unit and device numbers in corresponding digit positions of D8 column in list and proceed with matching.

- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5. Then replace specified card(s).

S2L

INFORMATION NOT AVAILABLE

AT THIS TIME

5-4. MXL FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions that cause the following conditions:

- 1) a load failure condition when loading from a device connected to the Multiplexer Channel, or
- 2) an error loop condition with the D1 display equal to 00F04 or 00F08 after a successful load from a device connected to the Multiplexer Channel.

To utilize this data, perform the following steps:

- Step 1. Record hexadecimal values observed in D1, A4, B1, C2, D2, D3, D4 and D5 displays.
- Step 2. Construct LSURL field by means of the following:
 - a) Did load attempt succeed? If yes, record an X in left-most L position; if no, leave left-most L position blank.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) Record an M in U position.
- Step 3. Construct LOAD field by means of the following:
 - a) Is LOAD WAIT indicator lit? If yes, record an X in L position; if no, leave L position blank.
 - b) Is LOAD NO DATA indicator lit? If yes, record an X in O position; if no, leave O position blank.
 - c) Is LOAD CHECK indicator lit? If yes, record an X in A position; if no, leave A position blank.
 - d) Is LOAD SUBSYSTEM CHECK indicator lit? If yes, record an X in D position; if no, leave D position blank.
- Step 4. Locate corresponding values in MXL formatted list by first matching D1 display value with D1 in list. Then match constructed LSURL field with LSURL column in list. Next match A4 display value with A4 in list, then match B1 display value with B1 in list, etc., ignoring any blank columns. Finally, match constructed LOAD field with LOAD column in list.

NOTE

The control unit and device numbers may appear in two right-most digits of D2 display, and second and third digits (from left) of A4 and C2 displays. If this occurs, substitute actual site control unit and device numbers in corresponding digit positions of D2, A4 and C2 columns in list and proceed with matching.

- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5. Then replace specified card(s).

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00000	M X		00000	00000	000C1	20000		00000	500	X
00000	M X	0C000	00000	0C000	000C0	20000	00401	00000	504	X
00000	M X	0C000	00000	1C000	000C0	20000	00401	00000	503	X
00000	M X	0C004	18001	10000	00000	0A840	00001	00000	503	
00000	M X	0C100	00000		000C1	20000	00401	00000	500	X
00000	M X	0C100	00000	00000	000C1	20000	00401	00000	502	X
00000	M X	0C100	00000	00000	000C1	20448	00401	00000	518	X
00000	M X	0C100	00000	0C100	000C1	20000	00401	00000	503	
00000	M X	0C100	00000	0C100	000C1	20000	00401	00000	500	X
00000	M X	0C100	00000	0C100	000C1	20000	00401	00000	503	X
00000	M X	0C100	00000	0C100	000C1	20000	00401	00000	518	X
00000	M X	0C100	00000	1C100	000C1	20000	00401	00000	518	X
00000	M X	0C100	0003F	00000	000C1	20000	00401	00000	500	X
00000	M X	0C100	01B40	00000	0F7CE	20000	00400	00000	509	
00000	M X	0C100	01B45	10000	00872	20000	00400	00000	509	
00000	M X	0C100	20000	10000	000C1	20000	00401		500	X
00000	M X	0C100	20000	10000	000C1	20000	00401	00000	500	X
00000	M X	0C100	20000	10000	000C1	20000	00401	00000	518	X
00000	M X	0C400	00000	00000	000C4	00018	00081	08200	302	X X
00000	M X	0C400	00000	00000	000C4	00018	00081	08600	302	X X
00000	M X	0C400	00000	00000	000C4	20000	00481	08000	301	X X
00000	M X	0C400	00000	00000	000C4	20000	00481	08200	302	X X
00000	M X	0C400	00000	00000	000C4	20040	00400	00000	161	
00000	M X	0C400	00000	00000	0C4C4	00018	00081	08E00	302	X X
00000	M X	0C400	00000	10000	000C4	00018	00081	08600	302	X X
00000	M X	0C400	00000	10000	000C4	00058	00001	00000	313	
00000	M X	0C400	00000	10000	001D4	00018	00001	09E00	302	X X
00000	M X	0C400	00000	10C00	000C4	20000	00404	10000	274	X

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00000	M X	0C400	00000	1C400	000C4	20000	00401	00000	301	X
00000	M X	0C400	00000	CYCLE	CYCLE	0001A	00001	08E00	302	X X
00000	M X	0C400	00000	CYCLE	CYCLE	0001A	00001	09E00	302	X X
00000	M X	0C400	00004	10000	00000	00004	10001	00000	309	X
00000	M X	0C400	20000	10000	000C4	20000	00401	00000	163	X
00000	M X	0C40C	00000	0C400	000C4	20000	00001	00000	163	X X
00000	M X	0D400	00000	00000	001D4	00018	00001	08E00	302	X X
00000	XM		00000	10000	00000	00000			612	
00000	XM	00000	00000	00000	00000	00000	00000	10000	161	X
00000	XM	00000	00000	00000	00000	00000	00000	10000	302	X
00000	XM	00000	00000	00000	00000	00000	00000	10000	321	X
00000	XM	00000	00000	00000	00000	00000	00000	10000	159	XX
00000	XM	00000	00000	00000	00000	00000	00000	10000	162	XX
00000	XM	00000	00000	00000	00000	00000	00000	10000	163	XX
00000	XM	00000	00000	00000	00000	00000	00000	10000	302	XX
00000	XM	00000	00000	00000	00000	00000	00000	10000	313	XX
00000	XM	00000	00000	00000	00000	00000	00000	20000	118	
00000	XM	00000	00000	00000	00000	00000	00000	20000	154	
00000	XM	00000	00000	00000	00000	00000	00000	20000	155	
00000	XM	00000	00000	00000	00000	00000	00000	20000	159	
00000	XM	00000	00000	00000	00000	00000	00000	20000	161	
00000	XM	00000	00000	00000	00000	00000	00000	20000	163	
00000	XM	00000	00000	00000	00000	00000	00000	20000	212	
00000	XM	00000	00000	00000	00000	00000	00000	20000	214	
00000	XM	00000	00000	00000	00000	00000	00000	20000	321	
00000	XM	00000	00000	00000	00000	00000	00010	18000	159	XXX
00000	XM	00000	00000	00000	00000	00000	00098	18000	159	XXX
00000	XM	00000	00000	00000	00000	00018	00000	10000	502	XX
00000	XM	00000	00000	00000	00000	00018	00000	11000	322	XX
00000	XM	00000	00000	00000	00000	00018	00000	11000	323	XX
00000	XM	00000	00000	00000	000C0	00000	00000	10000	601	XX
00000	XM	00000	00000	00000	000C0	20000	00401	10000	515	XX
00000	XM	00000	00000	00000	000C1	00000	00000	10000	624	XX
00000	XM	00000	00000	00000	000C1	00000	10000		616	XX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00000	XM	00000	00000	00000	000C1	20000	00401	10000	518	XX
00000	XM	00000	00000	00000	000C2	00018	00006	10000	314	XXX
00000	XM	00000	00000	00000	000C2	20000	00401	10008	118	XX
00000	XM	00000	00000	00000	000C4	00000	00000	10000	294	XX
00000	XM	00000	00000	00000	000C4	00000	00000	10000	301	XX
00000	XM	00000	00000	00000	000C4	00000	00000	10000	302	XX
00000	XM	00000	00000	00000	000C4	00000	00000	10000	311	XX
00000	XM	00000	00000	00000	000C4	00000	00000	10000	322	XX
00000	XM	00000	00000	00000	000C4	00000	00000	18000	307	XXX
00000	XM	00000	00000	00000	000C4	00000	00000	18000	323	XXX
00000	XM	00000	00000	00000	000C4	00000	00001	10000	302	XXX
00000	XM	00000	00000	00000	000C4	00000	00006	00000	304	XXX
00000	XM	00000	00000	00000	000C4	00000	00006	10000	303	XX
00000	XM	00000	00000	00000	000C4	00000	00006	10000	304	XX
00000	XM	00000	00000	00000	000C4	00000	00006	10000	302	XXX
00000	XM	00000	00000	00000	000C4	00000	00006	10000	304	XXX
00000	XM	00000	00000	00000	000C4	00000	00006	10000	305	XXX
00000	XM	00000	00000	00000	000C4	00000	00006	10000	309	XXX
00000	XM	00000	00000	00000	000C4	00000	00006	10000	310	XXX
00000	XM	00000	00000	00000	000C4	00000	00010	18000	305	XXX
00000	XM	00000	00000	00000	000C4	00000	00080	18000	305	XXX
00000	XM	00000	00000	00000	000C4	00000	00080	18000	311	XXX
00000	XM	00000	00000	00000	000C4	00000	00088	18000	311	XXX
00000	XM	00000	00000	00000	000C4	00008	00006	10000	304	XXX
00000	XM	00000	00000	00000	000C4	00018	00006	10000	304	XXX
00000	XM	00000	00000	00000	000C4	20000	00401	10000	121	XX
00000	XM	00000	00000	00000	000C4	20000	00401	10000	162	XX
00000	XM	00000	00000	00000	000C4	20000	00401	10000	311	XX
00000	XM	00000	00000	00000	000C4	20000	00401	10000	322	XX
00000	XM	00000	00000	00000	000C5	00000	00000	10000	293	XX
00000	XM	00000	00000	00000	000C5	20000	00401	10000	314	XX
00000	XM	00000	00000	00000	00114	00000	00000	10000	302	XX
00000	XM	00000	00000	00000	00114	00018	00000	10000	502	XX
00000	XM	00000	00000	00000	002C2	00000	00000	10000	216	XX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00000	XM	00000	00000	00000	0E003	00018	00000	10000	502	XX
00000	XM	00000	00000	00000	10000	00000	00000	10000	624	XX
00000	XM	00000	00000	00040	000C4	00000	00000	10000	278	XX
00000	XM	00000	00000	00080	0FFD6	0001A	20000	10000	314	X
00000	XM	00000	00000	00084	0FFC2	0001A	00006	10000	314	
00000	XM	00000	00000	00084	0FFC2	0001A	00006	10000	314	XX
00000	XM	00000	00000	00084	0FFC4	0001A	00006	10000	303	XX
00000	XM	00000	00000	00084	0FFC4	0001A	20006	10000	303	XX
00000	XM	00000	00000	00084	0FFD4	0001A	10000	10000	303	X
00000	XM	00000	00000	000A4	0FFE2	0001A	00006	10000	314	XX
00000	XM	00000	00000	000A4	0FFE4	0001A	00006	10000	303	XX
00000	XM	00000	00000	000C2	000C2	00018	00006	10000	314	XX
00000	XM	00000	00000	000C4	000C4	00018	00006	10000	303	XX
00000	XM	00000	00000	000C5	000C5	00018	00006	10000	314	XX
00000	XM	00000	00000	0C500	000C5	00000	00000	10000	293	XX
00000	XM	00000	00000	0CC00	000C4	00000	00000	10000	273	XX
00000	XM	00000	00000	10000	00000	00000			612	
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00000	XM	00000	00000	10000	00000	00000	00000	10000	308	
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00000	XM	00000	00000	10000	00000	00000	00000	10000	322	X
00000	XM	00000	00000	10000	00000	00000	00000	10000	155	XX
00000	XM	00000	00000	10000	00000	00000	00000	10000	159	XX
00000	XM	00000	00000	10000	00000	00000	00000	10000	161	XX
00000	XM	00000	00000	10000	00000	00000	00000	10000	302	XX
00000	XM	00000	00000	10000	00000	00000	00000	10000	313	XX
00000	XM	00000	00000	10000	00000	00000	00000	20000	150	
00000	XM	00000	00000	10000	00000	00000	00000	20000	151	
00000	XM	00000	00000	10000	00000	00000	00000	20000	153	
00000	XM	00000	00000	10000	00000	00000	00000	20000	154	
00000	XM	00000	00000	10000	00000	00000	00000	20000	159	
00000	XM	00000	00000	10000	00000	00000	00000	20000	214	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	00000	00000	10000	00000	00000	00000	20000	302	
00000	XM	00000	00000	10000	00000	00000	00000	20000	309	
00000	XM	00000	00000	10000	00000	00000	00000	20000	311	
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00000	XM	00000	00000	10000	00000	00000	00000	20000	155	X
00000	XM	00000	00000	10000	00000	00018	00000	10000	502	XX
00000	XM	00000	00000	10000	00000	00018	00000	11000	160	XX
00000	XM	00000	00000	10000	00000	00018	00000	11000	323	XX
00000	XM	00000	00000	10000	00000	20018	00000	10000	151	XX
00000	XM	00000	00000	10000	000C0	00000	00000	10000	604	XX
00000	XM	00000	00000	10000	000C1	00000	00000	10000	616	XX
00000	XM	00000	00000	10000	000C2	00008	00006	10000	314	XXX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	153	XX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	161	XX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	162	XX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	294	XX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	301	XX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	303	XX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	310	XX
00000	XM	00000	00000	10000	000C4	00000	00000	10000	321	XXX
00000	XM	00000	00000	10000	000C4	00000	00000	18000	305	XXX
00000	XM	00000	00000	10000	000C4	00000	00000	18000	307	XXX
00000	XM	00000	00000	10000	000C4	00000	00000	18000	309	XXX
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00000	XM	00000	00000	10000	000C4	00000	00006	10000	304	XX
00000	XM	00000	00000	10000	000C4	00000	00006	10000	312	XX
00000	XM	00000	00000	10000	000C4	00000	00006	10000	302	XXX
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00000	XM	00000	00000	10000	000C4	00000	00006	10000	307	XXX
00000	XM	00000	00000	10000	000C4	00000	00006	10000	311	XXX
00000	XM	00000	00000	10000	000C4	00000	00008	18000	308	XXX
00000	XM	00000	00000	10000	000C4	00000	00010	18000	271	XXX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	00000	00000	10000	000C4	00000	00010	18000	321	XXX
00000	XM	00000	00000	10000	000C4	00000	00088	18000	303	XXX
00000	XM	00000	00000	10000	000C4	00018	00006	10000	304	XXX
00000	XM	00000	00000	10000	000C4	20000	00401	10000	121	XX
00000	XM	00000	00000	10000	000C4	20000	00401	10000	162	XX
00000	XM	00000	00000	10000	000C5	00000	00000	10000	293	XX
00000	XM	00000	00000	10000	000C5	00000	00006	10000	314	XXX
00000	XM	00000	00000	10000	00114	00000	00000	10000	302	XX
00000	XM	00000	00000	10000	001C2	00000	00000	10000	118	XX
00000	XM	00000	00000	10000	001C2	00000	00000	10000	216	XX
00000	XM	00000	00000	10000	001C5	00000	00000	10000	286	XX
00000	XM	00000	00000	10000	002C2	00000	00000	10000	118	XX
00000	XM	00000	00000	10000	10000	00000		20000	612	
00000	XM	00000	00000	10000	C4000	00000	00000	10000	294	XX
00000	XM	00000	00000	10080	00000	20000	00000	00000	301	
00000	XM	00000	00000	10080	0FFD6	0001A	20000	10000	314	X
00000	XM	00000	00000	10084	0FFC4	0001A	20006	10000	303	XX
00000	XM	00000	00000	10084	0FFD4	0001A	20000	10000	310	X
00000	XM	00000	00000	100A4	0FFE4	0001A	00006	10000	303	XX
00000	XM	00000	00000	100C4	000C4	0001A	00006	10000	303	XX
00000	XM	00000	00000	100C4	000C4	10018	00006	10000	303	XX
00000	XM	00000	00000	1C400	000C4	00000	00000	0000	311	XX
00000	XM	00000	00000	1C500	000C5	00000	00000	10000	293	XX
00000	XM	00000	00000	1C600	000C4	00000	00000	10000	311	XX
00000	XM	00000	00A0F	10000	00000	00080	00001	00000	151	
00000	XM	0000E	00000	1CC00	00000	20000	00401	20000	321	XX
00000	XM	00045	00000	04580	000C4	20000	00080	18000	308	XXX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	000C4	00000	1C400	000C4	00001	20000	10000	311	XX
00000	XM	00100	00000	10000	00001	00000	00000	10000	286	
00000	XM	00200	00000	00000	000C4	00000	00080	18000	271	XXX
00000	XM	00200	00000	00000	000C4	00000	00080	18000	304	XXX
00000	XM	00200	00000	00000	000C4	00000	00080	18000	305	XXX
00000	XM	00200	00000	00000	000C4	00000	00080	18000	307	XXX
00000	XM	00200	00000	00000	000C4	00000	00080	18000	308	XXX
00000	XM	00200	00000	00000	000C4	00000	00080	18000	310	XXX
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00000	XM	00200	00000	00000	000C4	00000	00082	18000	308	XXX
00000	XM	00200	00000	00000	000C4	00000	00084	18000	308	XXX
00000	XM	00200	00000	00000	000C4	00000	00092	18000	304	XXX
00000	XM	00200	00000	003F4	000C4	00000	00080	18000	105	
00000	XM	00200	00000	10000	000C2	00000	00080	18000	105	XXX
00000	XM	00200	00000	10000	000C2	00000	00092	18000	314	XXX
00000	XM	00200	00000	10000	000C4	00000	00080	10000	307	XX
00000	XM	00200	00000	10000	000C4	00000	00080	18000	274	XXX
00000	XM	00200	00000	10000	000C4	00000	00080	18000	304	XXX
00000	XM	00200	00000	10000	000C4	00000	00080	18000	305	XXX
00000	XM	00200	00000	10000	000C4	00000	00080	18000	307	XXX
00000	XM	00200	00000	10000	000C4	00000	00080	18000	311	XXX
00000	XM	00200	00000	10000	000C4	00000	00080	18080	274	XXX
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00000	XM	00200	00000	10000	000C4	00000	00092	18000	304	XXX
00000	XM	00200	00000	10000	000C4	00000	00092	18000	311	XXX
00000	XM	00200	00000	10000	000C5	00000	00080	18000	293	XXX
00000	XM	00200	00000	10114	000C4	00000	00080	18000	310	XXX
00000	XM	00200	00000	10200	000C5	00000	00080	18000	293	XXX
00000	XM	00200	0E000	10000	000C2	00000	00080	18000	105	XXX
00000	XM	00400	00000	10000	000C4	00000	00000	10000	294	XX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	00400	00000	10000	000C4	00000	00080	18000	307	XXX
00000	XM	00500	00000	10000	00005	00000	00000	10000	292	XX
00000	XM	00500	00000	10500	000C5	00000	00000	10000	293	XX
00000	XM	00E00	00000	0C400	000C4	00000	00012	10000	323	X
00000	XM	00E00	00000	0C500	000C5	00000	00002	10000	315	XX
00000	XM	00E00	00000	1C500	000C5	00000	00002	10000	315	XX
00000	XM	00E00	00000	1C500	000C5	00000	00012	10000	315	XX
00000	XM	04200	00000	10000	00042	00000	00000	10000	118	XX
00000	XM	04400	00000	00000	00044	00000	00000	10000	215	XX
00000	XM	04400	00000	00000	000C4	00000	00000	10000	272	XX
00000	XM	04400	00000	00008	00044	00000	00000	10000	215	XX
00000	XM	04400	00000	00080	000C4	20000	00400	10000	272	X
00000	XM	04400	00000	10000	000C4	00000	00000	10000	272	XX
00000	XM	08000	00000	08000	00080	00000	00000	10000	215	XX
00000	XM	08000	00000	08000	000C4	00000	00000	10000	278	XX
00000	XM	08000	00000	10000	000C4	20000	00400	10000	307	X
00000	XM	08000	00000	18000	00082	00000	00000	10000	118	XX
00000	XM	08000	00000	18000	000C4	00000	00000	10000	272	XX
00000	XM	0C000	00000	01C00	0000C	00000	00001	10000	292	XXX
00000	XM	0C000	00000	0C000	000C0	00000	00001	10000	118	XXX
00000	XM	0C000	00000	1C000	000C0	00000	00001	10000	286	XX
00000	XM	0C000	00000	1C000	000C0	00000	00001	10000	216	XXX
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00000	XM	0C000	00000	1C000	0C000	20000	00041	10000	503	XX
00000	XM	0C000	00000	1C200	000C5	00000	00000	10000	293	XX
00000	XM	0C100	19900		00000		00400	00000	507	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	0C100	19900	00080	00000	20000	00400	00000	507	
00000	XM	0C100	19900	10080	00000	20000	00400	00000	407	
00000	XM	0C200	00000	00000	00114	00000	00000	10000	314	XX
00000	XM	0C200	00000	0C200	000C2	00000	00000	10000	314	XX
00000	XM	0C200	00000	0C200	000C2	20000	00401	10000	105	XX
00000	XM	0C200	00000	1C200	00000	00000	00000	10000	314	XX
00000	XM	0C200	00000	1C200	000C2	00000	00000	10000	314	XX
00000	XM	0C200	00000	1C200	000C2	20000	00401	10000	105	XX
00000	XM	0C200	00000	1C200	000C5	00000	00001	10000	293	XXX
00000	XM	0C200	19900	00080	00008	20000	00001	00000	216	
00000	XM	0C2DF	00000	00114	00114	00000	00000	10000	314	XX
00000	XM	0C2DF	00000	10114	00114	00000	00000	10000	314	XX
00000	XM	0C300	00000	0C300	000C3	00000	00001	10000	118	XXX
00000	XM	0C400	00000	00000	00000	00000	18000	10000	303	XX
00000	XM	0C400	00000	00000	000C4	00000	00000	10000	271	XX
00000	XM	0C400	00000	00000	000C4	00000	00000	10000	278	XX
00000	XM	0C400	00000	00000	000C4	00000	00000	10000	307	XX
00000	XM	0C400	00000	00000	000C4	00000	00000	10000	308	XX
00000	XM	0C400	00000	00000	000C4	00000	00000	10000	311	XXX
00000	XM	0C400	00000	00000	000C4	00000	00008	18000	305	XXX
00000	XM	0C400	00000	00000	000C4	00000	00010	10000	163	XX
00000	XM	0C400	00000	00000	000C4	00000	00010	18000	309	XXX
00000	XM	0C400	00000	00000	000C4	00000	00080	18000	304	XXX
00000	XM	0C400	00000	00000	000C4	00000	00080	18000	305	XXX
00000	XM	0C400	00000	00000	000C4	00000	00088	18000	305	XXX
00000	XM	0C400	00000	00000	000C4	00000	00088	18000	310	XXX
00000	XM	0C400	00000	00000	000C4	00000	00088	18000	311	XXX
00000	XM	0C400	00000	00000	000C4	00000	00090	18000	323	XXX
00000	XM	0C400	00000	00000	000C4	00000	00092	18000	308	XXX
00000	XM	0C400	00000	00000	000C4	00000	00092	18000	311	XXX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	0C400	00000	00000	00114	00000	00000	10000	303	XX
00000	XM	0C400	00000	00000	00114	00000	00090	18000	271	XXX
00000	XM	0C400	00000	00000	00114	00000	00090	18000	308	XXX
00000	XM	0C400	00000	00000	001D4	00018	00088	1FE00	302	XXX
00000	XM	0C400	00000	00040	000C4	00000	00000	10000	311	XX
00000	XM	0C400	00000	00080	000C4	20000	00000	10000	307	XX
00000	XM	0C400	00000	00114	000C4	00000	00000	10000	303	XX
00000	XM	0C400	00000	04400	000C4	00000	00084	18000	294	XXX
00000	XM	0C400	00000	05000	051D4	00000	00098	2FE00	322	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	271	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	272	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	273	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	278	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	303	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	305	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	307	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	311	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	308	XX
00000	XM	0C400	00000	0C400	000C4	00000	00000	10000	308	XXX
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00000	XM	0C400	00000	0C400	000C4	00000	00001	10000	308	XXX
00000	XM	0C400	00000	0C400	000C4	00000	00004	10000	271	XX
00000	XM	0C400	00000	0C400	000C4	00000	00004	10000	308	XX
00000	XM	0C400	00000	0C400	000C4	00000	00010	10000	311	XX
00000	XM	0C400	00000	0C400	000C4	00000	00012	10000	162	X
00000	XM	0C400	00000	0C400	000C4	00000	00040	10000	302	XX
00000	XM	0C400	00000	0C400	000C4	00000	00080	10000	309	XX
00000	XM	0C400	00000	0C400	000C4	00000	00080	18000	310	XXX
00000	XM	0C400	00000	0C400	000C4	20000	00401	00000	301	XX
00000	XM	0C400	00000	0C400	000C4	20000	00401	10000	162	XX
00000	XM	0C400	00000	0C400	000C4	20000	00401	10000	272	XX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	0C400	00000	0C400	000C4	20000	00401	10000	310	XX
00000	XM	0C400	00000	0C400	000C4	20000	00489	18000	151	X XX
00000	XM	0C400	00000	0C400	000C4	20000	00489	18000	160	X XX
00000	XM	0C400	00000	0C400	000C4	20000	00489	18000	322	X XX
00000	XM	0C400	00000	0C400	000C4	20000	08401	10000	311	XX
00000	XM	0C400	00000	0C600	000C4	00000	00084	18000	294	XXX
00000	XM	0C400	00000	0CCC0	00000	00000	00000	10000	306	XX
00000	XM	0C400	00000	0CE18	000C4	00000	00092	18000	304	XXX
00000	XM	0C400	00000	10000	00000	00000	00000	10000	303	
00000	XM	0C400	00000	10000	00000	00000	00000	10000	306	XX
00000	XM	0C400	00000	10000	000C4	00000	00000	10000	271	XX
00000	XM	0C400	00000	10000	000C4	00000	00000	10000	278	XX
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00000	XM	0C400	00000	10000	000C4	00000	00000	10000	303	XX
00000	XM	0C400	00000	10000	000C4	00000	00000	10000	308	XX
00000	XM	0C400	00000	10000	000C4	00000	00000	10000	310	XX
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00000	XM	0C400	00000	10000	000C4	00000	00000	10000	308	XXX
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00000	XM	0C400	00000	10000	000C4	00000	00010	10000	305	XX
00000	XM	0C400	00000	10000	000C4	00000	00010	18000	309	XXX
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00000	XM	0C400	00000	10000	000C4	00000	00080	18000	303	XXX
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00000	XM	0C400	00000	10000	000C4	00000	00090	18000	271	XXX
00000	XM	0C400	00000	10000	000C4	00000	00090	18000	305	XXX
00000	XM	0C400	00000	10000	000C4	00000	00090	18000	308	XXX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
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00000	XM	0C400	00000	10000	000C4	00000	00090	18000	311	XXX
00000	XM	0C400	00000	10000	000C4	00000	00090	18000	321	XXX
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00000	XM	0C400	00000	10000	00114	00000	00000	10000	303	XX
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00000	XM	0C400	00000	10000	001D4	00018	00088	1FE00	301	XXX
00000	XM	0C400	00000	10000	001D4	00018	00088	1FE00	302	XXX
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00000	XM	0C400	00000	1C400	00000	00000	00000	10000	151	XX
00000	XM	0C400	00000	1C400	000C4	00000	00000	10000	272	XX
00000	XM	0C400	00000	1C400	000C4	00000	00000	10000	273	XX
00000	XM	0C400	00000	1C400	000C4	00000	00000	10000	278	XX
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00000	XM	0C400	00000	1C400	000C4	00000	00001	10000	271	XXX
00000	XM	0C400	00000	1C400	000C4	00000	00001	10000	311	XX
00000	XM	0C400	00000	1C400	000C4	00000	00010	10000	323	XX
00000	XM	0C400	00000	1C400	000C4	00000	00080	10000	309	XX
00000	XM	0C400	00000	1C400	000C4	00000	00080	18000	303	XXX
00000	XM	0C400	00000	1C400	000C4	00000	00080	18000	310	XXX
00000	XM	0C400	00000	1C400	000C4	20000	00401	10000	153	XX
00000	XM	0C400	00000	1C400	000C4	20000	00401	10000	274	XX
00000	XM	0C400	00000	1C400	000C4	20000	00401	10000	322	XX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00000	XM	0C400	00000	1C400	000C4	20000	00401	20000	312	XX
00000	XM	0C400	00000	1C400	000C4	20000	00489	18000	322	X XX
00000	XM	0C400	00000	1C400	000C4	20000	08401	10000	312	XX
00000	XM	0C400	19900	10080	00000	20000	00400	00000	153	
00000	XM	0C4C4	00000	1C400	0C400	00000	00000	10000	321	XX
00000	XM	0C4FF	00000	0C400	0C4C4	00000	20010	20000	321	XX
00000	XM	0C4FF	00000	10114	00114	00000	00000	10000	303	XX
00000	XM	0C500	00000	00000	000C5	00000	00080	18000	315	XXX
00000	XM	0C500	00000	00000	000C5	00000	00088	18000	315	XXX
00000	XM	0C500	00000	0C500	000C4	00000	00000	10000	273	XX
00000	XM	0C500	00000	0C500	000C5	00000	00000	10000	314	XX
00000	XM	0C500	00000	0C500	000C5	00000	00000	10000	315	XX
00000	XM	0C500	00000	10200	000C5	00000	00084	18000	293	XXX
00000	XM	0C500	00000	1C500	00000	00000	00000	10000	150	XX
00000	XM	0C500	00000	1C500	000C4	00000	00000	10000	278	XX
00000	XM	0C500	00000	1C500	000C4	00000	00001	10000	273	XX
00000	XM	0C600	00000	0C600	000C4	00000	00001	10000	278	XXX
00000	XM	0C600	00000	0C600	000C4	20000	00401	10000	273	X
00000	XM	0C600	00000	1C600	000C4	00000	00000	10000	311	XX
00000	XM	0C600	00000	1C600	000C4	00000	00001	10000	273	XX
00000	XM	0C600	00000	1C600	000C4	20000	00401	10000	311	XX
00000	XM	0C600	00000	1C600	000C6	00000	00001	10000	118	XXX
00000	XM	0C600	00000	1C600	000C6	00000	00001	10000	216	XXX
00000	XM	0C600	00000	1C600	001D4	00000	00000	10000	161	XX
00000	XM	0C700	00000	0C700	000C5	00000	00000	10000	293	XX
00000	XM	0C700	00000	1C700	000C5	00000	00000	10000	293	XX
00000	XM	0CA00	00000	10000	000CA	00000	00000	10000	118	XX
00000	XM	0CC00	00000	00000	000C4	00000	00000	10000	273	XX

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00000	XM	0CC00	00000	10000	000C4	00000	00000	10000	273	XX
00000	XM	0CF00	00000	0CF00	000C5	00000	00000	10000	293	XX
00000	XM	0D000	00000	10000	000D0	00000	00000	10000	215	XX
00000	XM	0D100	00000	10000	000D1	00000	00000	10000	286	XX
00000	XM	0D200	00000	10000	000D2	00000	00000	10000	118	XX
00000	XM	0D400	00000	0D400	000C4	00000	00001	10000	272	XX
00000	XM	0D400	00000	10000	000C4	00000	00000	10000	272	XX
00000	XM	0E000	00000	00000	000E0	00000	00000	10000	215	XX
00000	XM	0E200	00000	10000	000E2	00000	00000	10000	118	XX
00000	XM	0E400	00000	00040	000C4	00000	00000	10000	272	XX
00000	XM	0E400	00000	10000	000C4	00000	00000	10000	272	XX
00000	XM	0E400	00000	1E400	000C4	00000	00000	10000	272	XX
00000	XM	10000	00000	00000	00FFF	20000	00400	10000	304	X
00000	XM	10000	00000	00000	00FFF	20000	00400	10000	314	X
00000	XM	10000	00000	00000	10000	00000	00004	10000	610	X
00000	XM	10000	00000	00001	00001	00000	00000	10000	285	X
00000	XM	10000	00000	10000	000C4	00000	000C0	18000	302	XXX
00000	XM	10000	00000	10000	000C4	00000	000C0	18000	311	XXX
00000	XM	10000	00000	10000	00FFF	20000	00400	10000	304	X
00000	XM	10000	00000	1000A	1000A	00000	10000	10000	287	X
00000	XM	10C00	00000	00080	000C5	20000	00000	10000	315	X
00000	XM	19900	00000	00000	00000	00000	00000	10000	303	XX
00000	XM	19900	00000	00000	00000	00000	00000	10000	314	XX
00000	XM	19900	00000	09900	00000	00000	00000	10000	304	X
00000	XM	19900	00000	09900	00000	00000	00000	10000	309	X
00000	XM	19900	00000	09900	00000	00000	00000	10000	304	XX
00000	XM	19900	00000	10000	00000	00000	00000	10000	303	XX
00000	XM	19900	00000	10000	00000	00000	00000	10000	304	XX
00000	XM	19900	00000	19900	00000	00000	00000	10000	309	X

D1	LSURL	A4	B1	C2	D2	D3	.D4	D5	FIG	LOAD	
00000	XM	19900	00000	19900	000C4	00000	00000	10000	308		X
00000	XM	19900	00000	19900	000C4	00000	00010	10000	162		X
00000	XM	19900	00000	19900	000C4	00000	00010	10000	322		X
00000	XM	19900	00000	19900	000C5	00000	00010	10000	315		
00000	XM	19900	00000	19900	000C5	00000	00010	10000	315		X
00000	XM	1C500	00000	10080	000C5	20000	00000	10000	314		XX
00000	XM	1C500	00000	1C500	000C5	00000	00010	10000	315		XX
00000	XM	1FF00	00000	0FF00	000C4	00000	00000	10000	308		X
00001	M X	0C400	00000	0C400	000C4	00048	00001	00000	312		
00002	M X	0C000	00000	10000	000C0	20000	00401	00000	515		X
00002	M X	0C120	00000		CYCLE	00040	00000	00000	503		
00002	M X	0C4FF	00000	00000	000C4	00060	00401	00000	159		
00002	M X	0C500	00000	10000	000C5	00000	00000	00000	155		X
00002	XM	00000	00000	00000	00000	00018	00000	10000	500		XX
00002	XM	00000	00000	00000	00000	00058	00000	10000	500		XX
00002	XM	0C100	00000	00080	00002	20040	00000	00000	518		
00002	XM	0C500	19900	00080	00900	20004	00001	00000	292		
00003	M X		00C00	00000	0048C	20004		08100	503		
00003	M X	08000	00C00	00000	0048C	20004	00400	08100	503		
00003	M X	08000	00C00	10000	0048C	20004	00400	08100	407		
00004	M X	08000	3C68E	04688	00000	20003	00400	00100	515		
00004	M X	0C000	00000	10000	000C0	20040	00400	00000	505		
00004	M X	0C000	19900	10000	00000	20000	00401	00000	504		X
00004	M X	0C100	19900	00000	00000	00000	00001	00000	502		X
00004	M X	0C100	233F0	01200	000C1	00040	00000	00000	502		
00004	M X	0C138	237F0	00031	000C1	00040	00000	00000	401		
00004	M X	0C400	00000	00000	00000	20040	00001	00000	153		

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00004	M X	0C400	19900	00080	00000	20000	00401	00000	309	X
00004	M X	0C400	19900	10080	00000	20000	00401	00000	309	X
00004	M X	0C400	1FFF0	10011	000C4	00040	00001	00000	310	
00004	M X	0C418	237F0	00456	000C4	00040	00000	00000	310	
00004	XM	00000	19900	00080	00100	20000	00000	00000	247	
00004	XM	00000	199F0	00003	00001	00020	00001	00000	245	
00004	XM	00000	199F0	00007	00001	00020	00001	00000	245	
00004	XM	00000	199F0	10001	00001	00020	00001	00000	246	
00004	XM	00100	199F0	10001	00001	00020	00001	00000	246	
00004	XM	00200	199F0	CYCLE	00003	00020	00001	00000	506	
00004	XM	0C000	19900		00000	20000	00400	00000	515	
00004	XM	0C000	19900	00080	00000	20000	00000	00000	211	
00004	XM	0C000	19900	00080	00000	20000	00400	00000	210	
00004	XM	0C000	19900	00080	00000	20000	00400	00000	211	
00004	XM	0C000	19900	00080	00000	20000	00400	00000	504	
00004	XM	0C000	19900	00080	00000	20000	00400	00000	515	
00004	XM	0C000	19900	00080	00000	20000	00401	00000	515	X
00004	XM	0C000	19900	00080	00000	20000	10000	00000	273	
00004	XM	0C000	19900	10080	00000	20000	00400	00000	515	
00004	XM	0C000	19900	10080	00000	20000	00401	00000	515	X
00004	XM	0C099	39900	00000	0A200	00000	00000		615	
00004	XM	0C100	19900		00000	20000	00001	00000	503	X
00004	XM	0C100	19900	00000	00000	20002	00000	00000	512	
00004	XM	0C100	19900	00080	00000	20000	00400	00000	509	
00004	XM	0C100	19900	00080	00000	20000	00401	00000	419	
00004	XM	0C100	19900	00080	00000	20000	00401	00000	503	X
00004	XM	0C100	19900	00080	00000	20002	00000	00000	512	
00004	XM	0C100	19900	10080	00000	20000	00400	00000	286	
00004	XM	0C100	19900	10080	00000	20000	00400	00000	518	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00004	XM	0C100	19900	10080	00000	20000	00401	00000	508	X
00004	XM	0C100	19900	10080	00000	20000	00401	00000	518	X
00004	XM	0C199	19903	09904	00903	01804	08000	00000	508	
00004	XM	0C200	19900	10000	00000	00000	00800	00000	241	
00004	XM	0C200	19900	10080	00000	20000	00400	00000	314	
00004	XM	0C200	19900	10080	00000	20000	00401	00000	241	X
00004	XM	0C200	19900	10080	00000	20000	00401	00000	295	X
00004	XM	0C400	19900	00000	00000	20000	00400	00000	209	
00004	XM	0C400	19900	00000	00000	20000	00401	00000	159	
00004	XM	0C400	19900	00080	00000	20000	00001	00000	252	
00004	XM	0C400	19900	00080	00000	20000	00001	00000	310	X
00004	XM	0C400	19900	00080	00000	20000	00400	00000	209	
00004	XM	0C400	19900	00080	00000	20000	00400	00000	225	
00004	XM	0C400	19900	00080	00000	20000	00401	00000	162	
00004	XM	0C400	19900	00080	00000	20000	00401	00000	252	
00004	XM	0C400	19900	00080	00000	20000	00401	00000	253	
00004	XM	0C400	19900	00080	00000	20000	00401	00000	153	X
00004	XM	0C400	19900	00080	00000	20002	00400	00000	254	
00004	XM	0C400	19900	00080	00A0A	20000	00400	00000	161	
00004	XM	0C400	19900	023FF	00000	00020	00001	00000	253	
00004	XM	0C400	19900	10080	00000	20000	00001	00000	310	X
00004	XM	0C400	19900	10080	00000	20000	00400	00000	153	
00004	XM	0C400	19900	10080	00000	20000	00400	00000	209	
00004	XM	0C400	19900	10080	00000	20000	00400	00000	310	
00004	XM	0C400	19900	10080	00000	20000	00401	00000	309	
00004	XM	0C400	19900	10080	00000	20002	00400	00000	254	
00004	XM	0C400	1FCF2	10202	0006A	04020	00001	00000	246	
00004	XM	0C4DF	39900	012FF	00000	00020	00001	00000	312	
00004	XM	0C500	19900	00080	00000	20000	00400	00000	287	
00004	XM	0C500	19900	00080	00000	20000	00400	00000	291	
00004	XM	0C500	19900	00080	00000	20000	00401	00000	252	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00004	XM	0C500	19900	00080	00000	20000	18401	00000	239	
00004	XM	0C500	19900	00080	00000	20002	00400	00000	250	
00004	XM	0C500	19900	00090	00000	24000	00401	00000	252	
00004	XM	0C500	19900	10080	00000	20000	00400	00000	287	
00004	XM	0C500	19900	10080	00000	20000	10000	00000	251	
00004	XM	0C500	3B9F0	CYCLE	04FBA	00020	00000	00000	251	
00004	XM	0C500	3B9F0	CYCLE	04FBC	00020	00000	00000	251	
00005	XM	0C000	39900	00080	00000	20000	00401	00000	210	
00005	XM	0C100	19900	00080	00000	20000	00400	00000	507	
00005	XM	0C400	39900	00080	00000	20000	00401	00000	310	
00005	XM	0C400	39900	10080	00000	20000	00401	00000	248	
00006	M X	0C100	00440	10000	0F7CE	20040	00400	00000	509	
00006	M X	0C400	00000	04400	04288	20000	00400	00000	242	
00006	XM	0C400	19900	00080	00000	20000	00400	00000	161	
00008	M X		23801	00000	000C0	00040		00000	505	
00008	M X	0C038	13801	00000	000C0	00040	00000	00000	505	
00008	M X	0C100	00000	10000	000C1	20000	00400	00000	500	
00008	XM	0C100	00080	00080	00008	20044	00400	00000	413	
00008	XM	0C100	00080	10080	00008	20044	00400	00000	413	
00008	XM	0C1DF	19900	0FFF0	00000	3C000	00000	00000	286	
00008	XM	0C400	19900	00080	00004	20000	18001	00000	249	
00008	XM	0C400	19900	10080	00000	20000	18001	00000	249	
00008	XM	0C400	19900	CYCLE	00000	00020	08001	00000	245	
0000A	XM	0C100	199D1	00000	00002	00820	00001	00000	216	
0000A	XM	0C400	19900	03FFF	00000	00020	00001	00000	253	
0000A	XM	0C400	19900	10080	00000	20000	00001	00000	301	X
0000C	M X	0C400	198F8	00008	00009	04008	10001	00000	245	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
0000C	XM	0C400	19908	10080	0100F	20000	10001	00000	253	
0000D	XM	0C200	19900	00080	00000	20000	00401	00000	216	
00012	XM	0C200	19999	10003	00999	00820	00001	00000	216	
00018	XM	0C400	39900	067FF	00000	00020	00000	00000	153	
0001C	M X	0C000	3C600	07F90	00010	00023	00001	00000	213	
0001C	M X	0C200	00400	00000	00000	20000	00401	00000	240	
0001C	M X	0C400	00400	00000	00000	20000	00401	00000	272	
0001C	M X	0C400	00400	10000	00000	20000	00401	00000	273	
0001C	M X	0C500	00400	10000	00000	20000	00001	00000	251	
0002E	M X	0C100	00400	00000	CYCLE	20040	00001	00000	506	
00030	M X	0C500	00130	00000	00038	2D000	00401	00000	289	
00032	M X	0C100	00000	00032	000C1	00418	00001	00000	500	X
00036	M X	0C400	00000	13C00	000C4	20040	00400	00000	153	
00036	M X	0C500	00000	03C00	000C5	20040	00400	00000	291	
0003D	M X	0C100	00000	1C100	000C1	20000	00401	00000	500	X
00040	M X	0C400	38000	119ED	10E00	20040	10000	00000	312	
00044	XM	0C40C	39900	10CF0	00000	3C000	00000	00000	310	
00048	M X	00000	00000	00000	00004	20040	00400	00000	315	
00048	M X	08000	39C00	0C48C	0048C	20004	00401	00100	163	X
00048	XM	0C0DF	39901	CYCLE	10000	3D000	08001	00000	505	
00080	XM	0C100	19900	00080	00000	20000	00400	00000	507	
00094	XM	0C500	19920	CYCLE	0001F	00020	00001	00000	252	
0009C	M X	0C100	00000	10000	000C1	00180	00001	00000	500	X
000A2	M X	0C400	04120	04810	04800	20000	00400	00000	290	
000C3	M X	0C100	00000	00000	000C1	20040	00400	00000	203	
000C3	M X	0C100	00000	00000	000C1	20040	00400	00000	403	
000C4	M X	0C038	23800	10000	000C0	00040	00000	00000	505	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
000C4	M X	0C100	23800	10000	000C1	00040	00000	00000	402	
000C4	M X	0C10C	23800	00000	000C1	3C040	00000	00000	286	X
000C4	M X	0C138	23800	00000	000C1	00040	00000	00000	402	
000C4	M X	0C138	23800	10000	000C1	00040	00000	00000	406	
000C4	M X	0C138	23800	10000	000C1	00040	08000	00000	402	
000C4	M X	0C200	00000	00000	000C2	20040	00400	00000	404	
000C4	XM	04500	1B9F0	000C0	00367	30020	00401	00000	248	
000C6	M X	0C400	00000	10000	000C4	20040	00400	00000	511	
000CE	M X	0C100	04000	10000	00000	20000	00400	00000	203	
000EA	M X	0C0FF	3D207	14030	0F2E9	3C004	00000	00000	505	
000EE	M X	0C100	04000	10000	00000	20000	00400	00000	203	
000EE	M X	0C100	CYCLE	CYCLE	CYCLE	20004	00400	00000	203	
00102	M X		00000	00000	000C1	00058		00000	407	X
00104	M X	0C100	00000	00000	000C1	00040	04001	00000	401	
00104	M X	0C100	00000	00000	000C1	00058	00001	00000	407	X
00104	M X	0C100	00000	00000	000C1	00058	00001	00000	408	X
00104	M X	0C100	00000	00000	000C1	00058	00001	00000	409	X
00104	M X	0C100	00000	10000	000C1	00058	00001	00000	409	X
00104	M X	0C100	23802	13802	000C1	20040	00000	00000	406	
00104	M X	0C400	00000	00000	000C4	00058	00001	00000	401	
00108	M X	0C100	00004	00000	10108	02008	11000	00000	500	
00108	XM	0C100	39900	00080	0FF00	20004	1C001	00000	508	
0010C	M X	0C100	00000	00000	000C1	00058	00001	00000	401	X
00118	XM	0C517	39900	037F0	00000	3C000	00000	00000	292	
0011A	XM	0C417	39900	037E0	00000	38000	00000	00000	161	
0011E	XM	0C400	199A8	10080	009D8	20000	00401	00000	214	
00192	M X	0C4D4	00028	10000	000C4	3E040	10001	00000	413	
00194	M X		03806	0380A	00002	3F860		00000	409	X

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00194	M X	0C400	00000	00000	000C4	20040	00000	00000	161	
00198	XM	0C000	19900	00080	00098	20000		00000	614	X
00198	XM	0C100	19900	00080	00000	20000	00401	00000	507	
00198	XM	0C100	19900	0D9F0	0D281	20004	00001	00000	403	X
00198	XM	0C100	19900	1D9F0	0D281	20004	00001	00000	403	X
00198	XM	0C100	39900	0FFF0	02FF0	00020	00001	00000	507	
00198	XM	0C100	39900	12FF0	02FF0	00020	00001	00000	507	
00198	XM	0C100	39900	CYCLE	CYCLE	00020	00001	00000	507	
001B4	M X	0C400	23800	00000	000C4	00040	00001	00000	310	
001B8	XM	00000	19900	00000	00000	00000	08000	00000	322	X
001B8	XM	00000	19900	00080	00000	20000	08000	00000	307	X
001B8	XM	08000	19900	00080	00000	20004	00001	00010	251	
001B8	XM	08000	19900	10080	00000	20000	18000	00100	309	
001B8	XM	0C400	19900	00080	00000	20000	00400	00000	289	
001B8	XM	0C400	19900	00080	00000	20000	00401	00000	312	
001B8	XM	0C400	19900	00080	00000	20000	04000	00000	313	
001B8	XM	0C400	39900	10080	00000	20000	00400	00000	310	
001B8	XM	0C4DF	19900	CYCLE	01FFE	00020	00001	00000	162	
001B8	XM	0C500	19900	08080	08000	20004	08001	00000	239	
001B8	XM	0C500	19900	10080	00000	20000	00401	00000	293	
001B8	XM	0C500	19900	10080	00000	20000	1C000	00000	156	
001B8	XM	0C500	19909	00080	10F0F	20000	18400	00000	287	
001B8	XM	0C5FF	19900	00000	00000	20000	18000	00000	156	
001B9	XM	05D00	19900	00080	00001	20000	00400	00000	255	
001B9	XM	05D00	19900	10080	00001	20000	00400	00000	216	
001B9	XM	0C000	19900	00080	00114	20004	00401	00000	210	
001B9	XM	0C400	19900	00080	0C440	20000	18001	00000	292	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
001BD	M X	0C4D0	047F0	141B9	001B9	3F820	00001	00000	313	
001C0	XM	00000	00000	100E0	001C0	00018	00000	10000	504	XX
001CE	M X	0C400	00000	00000	00184	20040	00401	00000	290	
001CE	M X	0C400	00000	10000	000C4	20040	00400	00000	516	
001CE	M X	0C400	001DE	00000	000C4	20040	00400	00000	516	
001EC	M X	0C100	05730	00000	001DC	20000	00401	00000	403	
001EE	M X	0C100	CYCLE	00000	CYCLE	20000	00401	00000	403	
001F0	M X	0C000	00000	10000	000C0	20000	00400	00000	515	
001F0	XM	00000	19900	00080	00088	20000	00001	00000	504	
001F4	M X	0C0FF	00000	10000	000C0	3F800	00401	00000	515	X
001F4	XM	0C400	19900	00084	00098	21000	18000	00000	249	
001F4	XM	0C437	39900	037F0	00098	3C000	00000	00000	310	
001F8	M X	0C000	00000	10000	000C0	20000	00401	00000	515	
001FC	M X	0C100	05730	10000	001DC	20000	00401	00000	403	
00200	XM	0C000	19900	10080	000F8	20000	00401	00000	211	
00211	M X	0C000	1DDDD	00247	00A8C	20000	00001	00000	210	
00211	M X	0C000	1DDDD	10247	00A8C	20000	00400	00000	210	
0022C	M X	0C400	1F0E0	10000	02281	00000	01001	00000	401	
00240	M X	08000	04100	14300	00242	20000	00400	00100	253	
00240	M X	0C100	01100	00000	00100	20000	00400	00000	403	
00240	M X	0C400	01100	10000	00100	20000	00400	00000	253	
00240	M X	0C500	01100	00000	00100	20000	00400	00000	255	
00241	M X	0C400	04100	00318	0024F	20000	00800	00000	290	
00262	M X	0C400	0E008	10710	00118	20000	00400	00000	253	
00278	M X	0C100	01619	01210	11629	20000	00400	00000	508	
0027A	M X	0C406	009E8	003F8	00278	12003	00001	00000	249	
0027C	XM	0C500	19910	00040	000F8	20000	00001	00000	252	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
002DA	M X	0C101	3D308	00300	00300	0206C	10000	00000	503	
002EA	M X	03800	04310	00004	00000	1C008	01000	00000	503	
003F0	M X	0C000	19803	00000	CYCLE	20008	08400	00000	211	
003FC	XM	0C400	19900	00080	00000	20000	00400	00000	225	
0047A	XM	0C400	19900	00080	00780	20000	00400	00000	161	
00482	XM	0C500	19900	10080	00C7E	20000	00400	00000	251	
00484	XM	0C000	19900	00080	00689	20004	00400	00000	211	
00484	XM	0C500	19900	10080	00689	20000	00400	00000	226	
00484	XM	0C500	19900	10080	00A8A	20000	00400	00000	252	
00484	XM	0C500	19980	CYCLE	00A8A	00020	00000	00000	252	
0048A	M X	0C100	19900	00080	00904	20004	00400	00000	286	
0048C	XM	0C000	19900		00488	20004	00400	00000	211	
0048C	XM	0C200	19900	10080	00488	20004	00400	00000	211	
0048C	XM	0C400	19900	00080	00488	20004	00000	00000	248	X
0048C	XM	0C400	19900	00080	004A8	20004	00400	00000	252	
0048C	XM	0C400	19980	00080	004A8	20004	00400	00000	248	
0048C	XM	0C500	19900	00080	00488	20004	00000	00000	252	X
0048C	XM	0C500	19910	00090	004A8	24004	00000	00000	252	
004A2	XM	0C000	19900	10080	0049E	20004	00000	00000	212	
004EA	XM	0C100	19990	000D0	000E1	20000	00001	00000	403	X
004F0	XM	0C0FF	19900	CYCLE	004EC	3F808	18000	00000	212	
004F9	XM	0C100	19900	000D9	000EB	20000	00001	00000	401	X
004F9	XM	0C100	19900	000D9	000EB	20000	00001	00000	403	X
00504	XM	0C000	19900		00A00	20000	00400	00000	210	
00504	XM	0C000	19900		00A00	20004	00400	00000	210	
00504	XM	0C100	19900	000F0	00103	20000	00001	00000	403	X
00504	XM	0C200	19900	00080	000F3	20000	00001	00000	404	
00504	XM	0C200	19900	00080	000F3	20000	00001	00000	415	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00504	XM	0C400	19900	00080	00100	20000	00400	00000	252	
00504	XM	0C400	19900	00080	00500	20004	00400	00000	225	
00504	XM	0C400	19900	10080	00600	20004	00000	00000	254	
00504	XM	0C500	19900	00080	00400	20000	00400	00000	251	
00504	XM	0C500	19900	10080	00500	20004	00400	00000	287	
0050E	M X	0C400	18584	00500	0050A	20000	00401	00000	288	
00600	XM	08000	19900	00080	001FC	20000	00400	00100	251	
00600	XM	0C400	19900	00080	005FC	20004	00000	00000	290	X
00604	XM	0C400	19900	00080	00C30	20004	00400	00000	225	
00604	XM	0C500	19900	00080	00500	20004	00400	00000	226	
0060A	XM	0C400	199F0	00601	00601	20000	00000	00000	312	
00614	XM	0C400	19900	00080	00610	20004	18400	00000	247	
00614	XM	0C500	19900	00080	00410	20000	00400	00000	251	
00650	XM	0C500	19900	00080	00E4C	20000	00001	00000	250	
00718	XM	0C100	19900	00080	00810	20000	1C001	00000	401	
00718	XM	0C1F7	19900	0F780	00810	20000	18001	00000	401	
007B2	XM	0C000	19900	00080	007B6	20000	00400	00000	212	
007EF	M X	0C444	CYCLE	0C400	CYCLE	2C044	00000	00000	312	
007FE	M X	0C100	007FC	007FE	CYCLE	00000	00001	00000	506	
007FE	M X	0C100	007FC	107FE	CYCLE	00000	00000	00000	506	
00802	M X	0C400	1C806	1C806	000C4	20040	00001	00000	153	
00806	M X	0C101	25840	1C85C	00840	21000	00000	00000	286	
00806	XM	0C100	19900	00080	00035	20004	00401	00000	508	
0081A	XM	0C200	19900	10080	00816	20004	00001	00000	216	
0081A	XM	0C500	19900	00080	00816	20004	00001	00000	255	
0081C	M X	0C400	24600	0CF90	00010	20000	00001	00000	209	
0082A	XM	0C100	19900	00080	03636	20000	00401	00000	405	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
0082A	XM	0C100	19900	00080	03636	20000	00401	00000	406	
0082A	XM	0C100	19900	00080	03636	20000	00401	00000	507	
00854	XM	0C000	19900	00080	00000	20000	00400	00000	504	
00854	XM	0C400	19900	00080	00C50	20000	00800	00000	247	
008DC	XM	0C500	19900	10080	008D8	20004	00001	00000	251	
008E6	XM	0C400	19900	00080	008E2	20004	00401	00000	242	
008E7	XM	00000	19900	00040	0D1C4	20004	00001	00000	503	X
008FB	M X	0C100	05B45	CYCLE	CYCLE	20000	00400	00000	203	
008FD	XM	0C500	19900	00080	008D8	20004	00400	00000	287	
009EF	M X	00000	3D0E0	10000	000E3	00040	00001	00000	313	
00A6A	XM	0C000	19900		00A66	20004	00400	00000	503	
00A7C	XM	0C0C4	39900		00A78	35004	00400	00000	515	
00A7C	XM	0C0C4	39900	1C4D4	00A78	35004	00400	00000	515	
00ADC	XM	0C200	19900	10080	00AD8	20004	00000	00000	216	
00ADC	XM	0C200	19900	10080	00AD8	20004	00400	00000	216	
00B7E	M X	08000	05828	04C00	00F4E	20000	00400	00000	209	
00B9A	XM	00800	19998	00480	00978	20004	10000	00000	241	
00C00	M X	0C200	20000	10808	00808	00008	10000	00000	241	
00C04	XM	0C000	19900		00C30	20004	00400	00000	210	
00C04	XM	0C400	19900		00800	20004	00400	00000	209	
00C04	XM	0C400	19900	10080	00800	20004	00400	00000	225	
00C04	XM	0C500	19900	10080	00A0A	20004	00000	00000	251	
00E2A	M X	0C400	04824	00000	CYCLE	20000	00401	00000	289	
00F08	M X	08000	047F0	10F04	00F04	20004	00400	00000	209	
00F08	M X	0C100	047F0	10F04	00F04	20000	00400	00000	203	
00F08	M X	0C400	047F0	00F04	00F04	20000	00000	00000	313	
00F08	M X	0C400	047F0	00F04	00F04	20000	00000	00000	310	X

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD		
00F08	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	273		
00F08	M	X	0C400	047F0	10F04	00F04	20000	00401	00000	214		
00F08	M	X	0C400	047F0	10F04	00F04	20800	18400	00000	246		
00F08	X	M	X	047F0	00F04	00F04	20000		00000	503		
00F08	X	M	X	00000	047F0	00F04	20000	00000	00000	403	X	
00F08	X	M	X	00000	047F0	00F04	20000	00000	00000	508	X	
00F08	X	M	X	00000	047F0	00000	00F04	20000	00400	00000	311	
00F08	X	M	X	00000	047F0	00001	00F04	20000	00400	00000	213	
00F08	X	M	X	00000	047F0	00F04	00F04	20000	00400	00000	211	
00F08	X	M	X	00000	047F0	00F04	00F04	20000	00401	00000	307	
00F08	X	M	X	00000	047F0	10F04	00F04	20000	00000	00000	203	X
00F08	X	M	X	00000	047F0	10F04	00F04	20000	00401	00000	274	
00F08	X	M	X	00000	047F0	10F04	00F04	20000	00401	00000	307	
00F08	X	M	X	08000	047F0	10F04	00F04	20000	00000	00000	301	X
00F08	X	M	X	0C000	047F0	0F04	20000	00400	00000	213		
00F08	X	M	X	0C000	047F0	00F04	20000	00400	00000	211		
00F08	X	M	X	0C000	047F0	00F04	00F04	20000	00400	00000	211	
00F08	X	M	X	0C000	047F0	00F04	00F04	20000	00400	00000	212	
00F08	X	M	X	0C000	047F0	10F04	00F04	20000	00400	00000	212	
00F08	X	M	X	0C100	047F0	00F04	20000	00401	00000	403	X	
00F08	X	M	X	0C100	047F0	00F04	00F04	20000	00401	00000	509	X
00F08	X	M	X	0C100	047F0	10F04	00F04	20000	00400	00000	217	
00F08	X	M	X	0C100	047F0	10F04	00F04	20000	00401	00000	506	X
00F08	X	M	X	0C100	047F0	10F04	00F04	20000	00401	00000	509	X
00F08	X	M	X	0C100	047F0	10F04	00F04	20000	00401	00000	510	X
00F08	X	M	X	0C200	047F0	00F04	00F04	20000	00000	00000	314	
00F08	X	M	X	0C200	047F0	10F04	00F04	20000	00401	00000	295	X
00F08	X	M	X	0C2FF	047F0	10350	00350	00000	20400	00000	314	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00000	00000	312	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD		
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00000	00000	306	X
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00000	00000	310	X
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00000	00000	313	X
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00020	00000	309	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	249	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	272	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	273	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	290	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	306	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	312	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	313	
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00400	00000	311	X
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00401	00000	241	X
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	00401	00000	245	X
00F08	X	M	X	0C400	047F0	00F04	00F04	20000	18400	00000	312	
00F08	X	M	X	0C400	047F0	10000	00F04	20000	00420	00000	311	
00F08	X	M	X	0C400	047F0	10F04	00F04	20000	00000	00000	306	
00F08	X	M	X	0C400	047F0	10F04	00F04	20000	00000	00000	308	
00F08	X	M	X	0C400	047F0	10F04	00F04	20000	00400	00000	272	
00F08	X	M	X	0C400	047F0	10F04	00F04	20000	00400	00000	312	
00F08	X	M	X	0C400	047F0	10F04	00F04	20000	00400	00000	313	
00F08	X	M	X	0C400	047F0	10F04	00F04	20000	00400	00000	323	
00F08	X	M	X	0C400	047F0	10F08	00F04	20000	00400	00000	313	
00F08	X	M	X	0C400	04EF0	00F04	00F04	20000	00401	00000	162	
00F08	X	M	X	0C4DF	047F0	00F04	00F04	3C000	00000	00000	312	
00F08	X	M	X	0C500	047F0	00F04	00F04	20000	00000	00000	155	
00F08	X	M	X	0C500	047F0	00F04	00F04	20000	00400	00000	315	
00F08	X	M	X	0C500	047F0	00F04	00F04	20000	00401	00000	287	X
00F08	X	M	X	0C500	047F0	00F04	00F04	3F000	00000	00000	293	
00F08	X	M	X	0C500	047F0	10F04	00F04	20000	00400	00000	255	
00F08	X	M	X	0C500	047F0	10F04	00F04	20000	00400	00000	291	
00F08	X	M	X	0C500	047F0	10F04	00F04	20000	00400	00000	315	
00F08	X	M	X	CYCLE	047F0	00F04	00F04	20000	00400	00000	287	
00F0A		M	X	0C40F	38000	00F0E	00FCF	23840	00400	00000	285	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
00F18	XM	00004	19900	CYCLE	00F14	00024	00001	00000	216	
00FCA	M X	0C400	00000	00000	000C4	00060	00001	00000	413	X
01004	XM	0C200	19910	01080	01010	20000	00401	00000	240	
01004	XM	0C246	19910	056F8	01454	3E004	00001	00000	240	
01046	XM	0C400	39900	00080	00042	20000	00400	00000	209	
0112E	XM	06800	19900	00080	130FE	20000	00400	00000	250	
01134	M X	0C147	254A0	000A8	00450	20000	00400		409	
012DF	XM	0C500	19900	00080	002D0	20004	00400	00000	287	
0131C	XM	0C000	19900	00080	01318	20004	00400	00000	210	
013A4	M X	0C400	00AA2	00200	008AA	20000	00001	00000	242	
01404	XM	0C400	19900		0040F	20000	00400	00000	209	
01404	XM	0C400	19900		00A0A	20000	00400	00000	209	
01404	XM	0C400	19900	10080	00C32	20004	00400	00000	225	
01404	XM	0C500	19900	00040	01E4E	20000	00000	00000	250	
01404	XM	0C500	19900	10080	01000	20004	00400	00000	251	
016FF	M X	08000	CYCLE	00000	CYCLE	20004	00400	00100	242	
01904	XM	0C000	19900	00000	0CB01	20000	00001	00000	505	
01904	XM	0C000	19900	10080	0CBD0	20000	00001	00000	505	
0192D	XM	0C400	19900	00080	0C3F8	20000	18401	00000	241	
0192D	XM	0C400	19900	10080	0C3F8	20000	18401	00000	241	
0192D	XM	0C500	19900	00080	0C3F8	20000	18401	00000	251	
0192D	XM	0C500	19900	00080	0CBF8	20000	18401	00000	251	
01A5A	XM	08013	19900	12FFF	051CE	00024	00001	00000	310	X
01BC3	M X	0C000	18000	00000	000C0	20040	00401	00000	210	
01D19	XM	0C000	19900	00080	0CBE4	20000	18001	00000	210	
01EDD	XM	0C400	19900	10080	0CF9C	20000	00000	00000	243	X
01F5A	M X	08000	05C50	000FF	00058	20000	00400	00100	285	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
01FCA	M X	0C400	00000	00000	0182A	20040	00401	00000	305	
01FCE	M X	00000	00000	10000	00F04	20040	00000	00000	161	
01FCE	M X	08000	38000	10000	00F04	20044	00001	00040	290	X
01FCE	M X	08000	CYCLE	10000	00F04	20044	00001	00040	290	X
01FCF	M X	09900	CYCLE	00000	CYCLE	20040	00400	00000	507	
02004	XM	0C200	1B910	CYCLE	02021	00000	00001	00000	240	
020D8	XM	0C500	19900	000F0	0243E	3C000	00000	00000	292	X
02174	XM	0C400	19900	00080	02170	20004	00000	00000	252	
021E8	XM	0C200	19900	10080	023E4	20000	00400	00000	216	
021E8	XM	0C400	19900	00080	025E4	20004	00400	00000	216	
021E8	XM	0C400	19900	10080	021E4	20004	00000	00000	244	
021E8	XM	0C400	19900	10080	021E4	20004	00400	00000	244	
021E8	XM	0C400	19900	10080	029E4	20004	00400	00000	216	
021E8	XM	0C500	19900	00000	021E4	20004	00400	00000	252	
021E8	XM	0C500	19900	00080	021E0	20000	00400	00000	287	
02298	XM	0C400	19999	10090	01B38	20000	00000	00000	244	
02400	M X	0C200	00000	02000	000C2	20000	00401	00000	607	X
02404	XM	0C400	19900		00A0A	20000	00400	00000	209	
02404	XM	0C500	1B900	00080	02E66	20000	00000	00000	250	
02444	XM	0E200	1B920	00040	02480	20000	00400	00000	105	
02FC2	M X	0C400	00000	10000	0219E	20040	00400	00000	247	
03001	M X	0C100	000F0	0C19E	000C1	20040	18000	00000	286	
03003	M X	0C107	000F0	0C1BE	000C1	00040	00000	00000	286	
0308C	XM	0C200	39900	00080	003FB	20000	00400	00000	211	
03302	XM	0C400	19910	00080	01910	20000	00400	00000	247	
03328	XM	0C400	19900	00080	03324	20004	00000	00000	252	
03328	XM	0C400	19900	00080	03324	20004	00400	00000	252	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
03396	XM	0C400	19900	00080	05A40	20000	00400	00000	244	
033B6	XM	0C400	19900	00080	00080	20000	00000	00000	252	X
03409	XM	0C400	19900	10000	01000	00000	00801	00000	289	
035F6	M X	08000	04710	00110	035CA	20000	00400	00000	509	
03800	M X	0C100	20000	00000	000C1	20000	00401	00000	500	X
03800	M X	0C100	20000	03800	000C1	20008	00401	00000	503	X
03800	M X	0C100	20000	03800	000C1	20018	00401	00000	419	X
03800	M X	0C200	20000	0C800	000C2	20000	00401	00000	500	X
03800	M X	0C400	20000	03800	000C4	20018	00401	00000	153	X
03800	M X	0C400	20000	03800	000C4	20018	00401	00000	162	X
0380E	XM	0C100	39900	00080	00000	20000	00400	00000	508	
0380E	XM	0C100	39900	00080	00900	20000	00400	00000	403	
0381C	XM	0C000	19900	10800	00444	20000	00400	00000	503	
0381C	XM	0C000	39900	00080	00444	20000	00401	00000	504	X
0381C	XM	0C000	39900	10080	00D44	20000	00400	00000	503	
03832	M X	0C400	20000	03832	000C4	20798	00401	00000	153	X
03966	XM	0CC00	19940	10000	0EF62	10000	08001	00000	252	
03BCE	M X	0C100	20000	00000	000FC	00020	00000	00000	518	
03CFE	M X	0C400	CYCLE	CYCLE	CYCLE	20000	00400	00000	247	
03FFF	M X	09000	CYCLE	00404	CYCLE	20000	08000	00000	241	
04404	XM	0C400	19900		00000	20000	00400	00000	209	
04404	XM	0C400	19900		00194	20004	00400	00000	209	
04404	XM	0C400	19900		00A0A	20000	00400	00000	209	
04404	XM	0C400	19900	10080	00000	20000	00400	00000	225	
04F4C	M X	08000	38000	00000	04F04	20040	00400	00100	250	
04FCA	M X	0C400	00000	00000	04E7E	20044	00400	00000	209	
04FCC	M X	0C200	02000	12000	02A4F	20040	00401	00000	240	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
05010	XM		00000	00000	000C1	22180		00000	500	X
050D0	XM	0C000	19900	00080	00A0A	20000	00400	00000	504	
050D0	XM	0C100	19900	00080	00A0A	20000	00400	00000	507	
050D0	XM	0C100	19900	00080	00A0A	20000	00400	00000	509	
050D0	XM	0C100	19900	00080	00A0E	20040	00400		509	
050D0	XM	0C100	19900	00080	00A0E	20040	00400	00000	509	
050D0	XM	0C400	19900	00080	00A0A	20000	00400	00000	517	
05FFE	M X	0C500	CYCLE	CYCLE	CYCLE	20000	00000	00000	250	
06404	XM	0C400	19900		00000	20000	00400	00000	209	
06974	XM	0C000	199DD	00080	00000	20004	00400	00000	505	
07FCB	M X	0C100	18000	00000	00000	20040	00001	00000	503	X
07FCB	M X	0C100	18000	00000	0FF00	20040	00001	00000	503	X
08004	XM	0C400	19900	10080	00000	20000	00400	00000	209	
08004	XM	0C580	19970	0C77F	08081	00004	00001	00000	239	
08404	XM	0C400	19900		00000	20000	00400	00000	209	
08404	XM	0C400	19900	10080	00099	20000	00400	00000	225	
08404	XM	0C500	19900	00080	0D134	20004	00000	00000	250	
0848C	XM	0C400	19980	1B7FF	08508	00024	00000	00000	274	
0848C	XM	0C400	19980	1D0FF	08508	00024	00000	00000	274	
0993C	XM	0C200	19900	00080	04F88	20000	00000	00000	105	
0993C	XM	0C500	39900	10080	09834	20000	00001	00000	252	
09FFF	M X	00000	CYCLE	00000	CYCLE	20040	00000	00000	250	
0A02E	XM	0C400	00002	158D0	00000	20000	00410	00000	307	
0A0AE	M X	0C000	CYCLE	10000	020AD	00041	00000	00000	505	
0B000	M X	0C100	1C0CC	047F0	00010	20040	00400	00000	507	
0B000	M X	0C100	1C0CC	047F0	000C1	20040	00400	00000	507	
0B000	XM	0C100	19900	10080	00A0A	20000	00400	00000	507	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
0B000	XM	0C400	19900	10080	00A0A	20000	00400	00000	511	
0B0C0	M X	0C100	047F0	147F8	000CC	20000	00400	00000	507	
0B8B5	M X	00000	1FE25	10000	00973	00020	08001	00000	313	
0C3BA	XM	0C500	19900	00000	0C228	00004	00801	00000	255	
0CC22	XM	0C400	39900	00040	00816	00024	00000	00000	253	
0D958	XM	0C400	19900	00080	0C994	20000	18001	00000	216	
0F022	XM	0C000	199BC	00080	000B0	20004	08401	00000	505	
0FFCB	M X	0C100	00000	00000	000C1	20080	00401	00000	500	X
10001	M X	0C100	00000	00000	000C1	00710	00001	00000	500	X X
100CA	M X	0C1F5	18000	00000	000C1	1F040	0C001	00000	286	
14008	M X	0C040	1FC90	07373	00000	00040	00001	00000	211	
14648	M X	0C147	3FC40	CYCLE	CYCLE	20003	00401	00000	508	
1BFBF	M X	0C49C	1F56C	1BCBC	0BBB1	2F800	40001	00000	401	
1FF8B	M X	0C5FF	CYCLE	CYCLE	000C5	27840	00000	00000	155	X
1FFFF	XM	0C400	1FC00	10849	00043	00024	00001	00000	252	
CYCLE	M X		00000	10000	000C1	00058		00000	405	
CYCLE	M X		00000	18080	000C1	00058		00000	405	
CYCLE	M X		CYCLE	10000	CYCLE	20044		00000	409	
CYCLE	M X	00000	00000	00000	00000	20040	00400	00000	253	
CYCLE	M X	00000	00000	00000	CYCLE	00008	00000		402	
CYCLE	M X	000C4	00000	00000	00F04	35040	00001	00000	213	
CYCLE	M X	000C4	00000	10000	00000	01040	CYCLE	00000	313	
CYCLE	M X	00200	00000	00000	00F02	20040	00000	00000	255	
CYCLE	M X	00800	CYCLE	10000	CYCLE	20040	00400	00000	247	
CYCLE	M X	00804	0A400	CYCLE	00004	21002	18001	00000	313	
CYCLE	M X	02E00	CYCLE	CYCLE	CYCLE	20000	00400	00000	203	
CYCLE	M X	04C00	38000	10000	0FFC0	20040	00000	00000	313	X

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
CYCLE	M X	08000	00400	10000	00000	20000	00400	00100	203	
CYCLE	M X	08000	38000	10000	05E5E	20040	00400	00100	406	
CYCLE	M X	08000	CYCLE	00000	00F04	20040	00400	00100	292	
CYCLE	M X	08000	CYCLE	00000	CYCLE	20004	00400	00100	242	
CYCLE	M X	08000	CYCLE	00000	CYCLE	20044	00400	00100	405	
CYCLE	M X	0800C	38000	00000	00F04	00060	00000	00000	211	
CYCLE	M X	0800C	38000	00000	00F04	20044	00000	00000	515	
CYCLE	M X	0C000	00000	00000	000C0	00058	00001	00000	503	
CYCLE	M X	0C000	00000	CYCLE	000C0	20000	00401	00000	503	X
CYCLE	M X	0C100	00000	00000	00016	20044	02001	00000	508	X
CYCLE	M X	0C100	00000	00000	000C1	00048	00001	00000	405	
CYCLE	M X	0C100	00000	00000	000C1	00048	00001	00000	512	
CYCLE	M X	0C100	00000	00000	000C1	00050	00001	00000	512	
CYCLE	M X	0C100	00000	00000	000C1	00058	00000	00000	508	
CYCLE	M X	0C100	00000	00000	000C1	00058	00001	00000	405	
CYCLE	M X	0C100	00000	00000	000C1	00058	00001	00000	419	
CYCLE	M X	0C100	00000	00000	000C1	00058	00001	00000	502	
CYCLE	M X	0C100	00000	00000	000C1	20040	00001	00000	403	
CYCLE	M X	0C100	00000	00000	000C1	20040	00400	00000	413	
CYCLE	M X	0C100	00000	10000	000C1	00040	00801	00000	217	
CYCLE	M X	0C100	00000	10000	000C1	00048	00001	00000	512	
CYCLE	M X	0C100	00000	10000	000C1	00058	00001	00000	508	
CYCLE	M X	0C100	00000	10100	1040F	20005	00801	00000	512	
CYCLE	M X	0C100	00000	18080	000C1	00058	00001	00000	405	
CYCLE	M X	0C100	000C1	000C1	000C1	20040	00001	00000	503	
CYCLE	M X	0C100	000C1	100C1	000C1	00040	00001	00000	506	
CYCLE	M X	0C100	000C1	100C1	000C1	20040	00001	00000	503	
CYCLE	M X	0C100	00200	10000	CYCLE	20000	00400	00000	203	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
CYCLE	M X	0C100	00400	10000	CYCLE	20000	00400	00000	203	
CYCLE	M X	0C100	01B45	00000	CYCLE	00000	00000	00000	417	
CYCLE	M X	0C100	041ED	CYCLE	CYCLE	00071	00001	00000	500	
CYCLE	M X	0C100	18000	00000	0028A	20040	00001	00000	502	X
CYCLE	M X	0C100	CYCLE	00000	0014C	00040	00001	00000	506	
CYCLE	M X	0C100	CYCLE	00000	CYCLE	20000	00401	00000	406	
CYCLE	M X	0C100	CYCLE	00000	CYCLE	20040	00400	00000	508	
CYCLE	M X	0C100	CYCLE	CYCLE	000C1	20042	18000	00000	403	
CYCLE	M X	0C199	20000	00000	00044	00840	00001	00000	402	
CYCLE	M X	0C199	3F000	00000	000FF	00804	00001	00000	402	
CYCLE	M X	0C1F0	0030B	10000	CYCLE	3C044	00401	00000	409	
CYCLE	M X	0C200	00000	00000	000C2	00048	00001	00000	315	
CYCLE	M X	0C200	00000	10000	000C2	00050	00001	00000	315	
CYCLE	M X	0C200	00000	10000	15140	20040	00401	00000	241	
CYCLE	M X	0C200	00000	10000	CYCLE	20064	18001	00000	315	
CYCLE	M X	0C200	19999	10000	0099B	00820	00001	00000	216	
CYCLE	M X	0C200	20800	10800	CYCLE	20000	18000	00000	241	
CYCLE	M X	0C400	00000	00000	00000	00040	00001	00000	151	
CYCLE	M X	0C400	00000	00000	00000	00040	00001	00000	160	
CYCLE	M X	0C400	00000	00000	00000	00040	00001	00000	285	
CYCLE	M X	0C400	00000	00000	00000	01040	00001	00000	245	
CYCLE	M X	0C400	00000	00000	00000	20040	00001	00000	243	X
CYCLE	M X	0C400	00000	00000	00000	20044	1C001	00000	254	
CYCLE	M X	0C400	00000	00000	000C4	00040	00001	00000	323	
CYCLE	M X	0C400	00000	00000	000C4	00058	00001		159	
CYCLE	M X	0C400	00000	00000	000C4	00058	00001	00000	163	
CYCLE	M X	0C400	00000	00000	000C4	00058	00001	00000	310	
CYCLE	M X	0C400	00000	00000	000C4	20040	00400	00000	209	

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
CYCLE	M	X	0C400	00000	00000	000C4	20040	00401	00000	155
CYCLE	M	X	0C400	00000	00000	00144	CYCLE	00001	00000	312
CYCLE	M	X	0C400	00000	0C400	000C4	20000	00400	00000	162
CYCLE	M	X	0C400	00000	10000	00000	00840	00001	00000	246
CYCLE	M	X	0C400	00000	10000	00000	02040	00001	00000	245
CYCLE	M	X	0C400	00000	10000	00000	20040	00801	00000	214
CYCLE	M	X	0C400	00000	10000	000C4	00040	00001	00000	160
CYCLE	M	X	0C400	00000	10000	000C4	00040	00001	00000	322
CYCLE	M	X	0C400	00000	10000	000C4	00040	00001	00000	323
CYCLE	M	X	0C400	00000	10000	000C4	00058	00001	00000	313
CYCLE	M	X	0C400	00000	10000	000C4	20040	00400	00000	209
CYCLE	M	X	0C400	00000	10000	000C4	20040	00401	00000	285
CYCLE	M	X	0C400	00000	10000	00142	00040	00001	00000	274
CYCLE	M	X	0C400	00000	10000	00221	00020	00000	00000	289
CYCLE	M	X	0C400	00000	10000	00543	00040	00001	00000	273
CYCLE	M	X	0C400	00000	10000	15140	20040	00400	00000	241
CYCLE	M	X	0C400	00000	CYCLE	000C4	20040	00400	00000	161
CYCLE	M	X	0C400	00000	CYCLE	000C4	20040	00400	00000	162
CYCLE	M	X	0C400	00080	00080	00080	20040	00401	00000	245
CYCLE	M	X	0C400	000C4	000BD	CYCLE	00058	00001	00000	401
CYCLE	M	X	0C400	000C4	000C4	000C4	20040	08001	00000	312
CYCLE	M	X	0C400	000C4	100C4	000C4	20040	08001	00000	312
CYCLE	M	X	0C400	00200	00200	00000	20000	00400	00000	242
CYCLE	M	X	0C400	19900	00030	00030	24040	00001	00000	254
CYCLE	M	X	0C400	19900	00080	00114	20000	00401	00000	252
CYCLE	M	X	0C400	1F0FF	000F0	00B7E	00000	00001	00000	401
CYCLE	M	X	0C400	23800	0C800	000C4	20040	00000	00000	161
CYCLE	M	X	0C400	38000	00000	1002B	20040	00400	00000	294

X

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
CYCLE	M	X	0C400	38000	00000	1134A	20040	00400	00000	253
CYCLE	M	X	0C400	38000	10000	0FF00	20040	1C000	00000	290
CYCLE	M	X	0C400	39C02	001FF	1FFFE	20007	00400	00000	313
CYCLE	M	X	0C400	3FF00	0FF00	00DFF	20042	18000	00000	285
CYCLE	M	X	0C400	CYCLE	00000	CYCLE	20004	18001	00000	254
CYCLE	M	X	0C400	CYCLE	00000	CYCLE	20040	00400	00000	247
CYCLE	M	X	0C400	CYCLE	CYCLE	000C4	20042	00000	00000	162 X
CYCLE	M	X	0C400	CYCLE	CYCLE	CYCLE	20046	00000	00000	290
CYCLE	M	X	0C4DF	CYCLE	1C400	CYCLE	CYCLE	00000	00000	312
CYCLE	M	X	0C500	00000	00000	000C5	00058	00001	00000	315
CYCLE	M	X	0C500	00000	00000	0045C	20040	00400	00000	287
CYCLE	M	X	0C500	00000	00000	10266	20004	00400	00000	251
CYCLE	M	X	0C500	00000	00000	CYCLE	00040	00000	00000	255
CYCLE	M	X	0C500	00000	00000	CYCLE	00044	08001	00000	251
CYCLE	M	X	0C500	00000	10000	00000	20040	00001	00000	314 X
CYCLE	M	X	0C500	00000	10000	000C5	00048	00001	00000	315
CYCLE	M	X	0C500	00000	10000	000C5	00058	00001	00000	315
CYCLE	M	X	0C500	00000	10000	000C5	20040	00401	00000	289
CYCLE	M	X	0C500	00000	CYCLE	000C5	20040	00400	00000	291
CYCLE	M	X	0C500	000FF	000FF	113FF	20040	00000	00000	289
CYCLE	M	X	0C500	04040	040D8	140D8	20000	00401	00000	239
CYCLE	M	X	0C500	1C100	0C500	000C5	20040	18001	00000	293
CYCLE	M	X	0C500	1C500	0C500	000C5	20040	10001	00000	293
CYCLE	M	X	0C500	1D1E4	CYCLE	CYCLE	20040	00400	00000	287
CYCLE	M	X	0C500	1FF00	CYCLE	00A0A	20040	00400	00000	291
CYCLE	M	X	0C500	38000	10000	1A42C	20040	18401	00000	278
CYCLE	M	X	0C500	CYCLE	00000	00000	20000	00401	00000	289

D1	LSURL	A4	B1	C2	D2	D3	D4	D5	FIG	LOAD
CYCLE	M	X	0C500	CYCLE	00000	CYCLE	20000	00401	00000	289
CYCLE	M	X	0C500	CYCLE	10000	CYCLE	20000	00401	00000	289
CYCLE	M	X	0C500	CYCLE	CYCLE	CYCLE	20000	00000	00000	239
CYCLE	M	X	0C50C	00000	10000	1018A	00060	08000	00000	314 X
CYCLE	M	X	0C5C0	00000	00000	15140	20040	00001	00000	251
CYCLE	M	X	0E000	00000	10000	00000	00060	00001	00000	285
CYCLE	M	X	20000	CYCLE	CYCLE	CYCLE	20040	00000	00000	216
CYCLE	M	X	CYCLE	1DC40	CYCLE	CYCLE	00004	00001	00030	251
CYCLE	M	X	CYCLE	CYCLE	00000	CYCLE	CYCLE	00000	00000	249
CYCLE	M	X	CYCLE	CYCLE	10000	CYCLE	20040	00400	00000	409
CYCLE	XM		00000	000E1	100E1	00000	00000	00000	20000	500
CYCLE	XM		08000	39900	10080	00616	20000	00400	00100	251

5-5. PRL FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions that cause one of the following conditions:

- 1) a load failure with the D1 display equal to 00400 through 00470, or
- 2) an error stop or loop condition (in DMR Prelude program) with the D1 display equal to 001E8 through 00FFF (excluding 00F04 and 00F08) after a successful load, or
- 3) an error stop or loop condition with the D1 display equal to 06000 or above after a successful load, or
- 4) an error stop or loop condition with the D1 display cycling after a successful load.

To utilize this data, perform the following steps:

- Step 1. Record hexadecimal values observed in D1, B1, C1, C3, D2, and D3 displays.
- Step 2. Construct LSURL field by means of the following:
 - a) Did load attempt succeed? If yes, record an X in left-most L position; if no, leave left-most L position blank.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) What loading device was used? If Selector Channel tape unit, record a T in U position; if Selector Channel disc unit, record a D in U position; if Multiplexer Channel tape unit, record an M in U position.
- Step 3. Construct LOAD field by means of the following:
 - a) Is LOAD WAIT indicator lit? If yes, record an X in L position; if no, leave L position blank.
 - b) Is LOAD NO DATA indicator lit? If yes, record an X in O position; if no, leave O position blank.
 - c) Is LOAD CHECK indicator lit? If yes, record an X in A position; if no, leave A position blank.
 - d) Is LOAD SUBSYSTEM CHECK indicator lit? If yes, record an X in D position; if no, leave D position blank.
- Step 4. Locate corresponding values in PRL formatted list by first matching D1 display value with D1 in list. Then match constructed LSURL field with LSURL column in list. Next match B1 display value with B1 in list, etc., ignoring any blank columns. Finally, match constructed LOAD field with LOAD column in list.
- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5. Then replace specified card(s).

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
001F0	XXT	19900	00009	00041	00088	20000	209	
001F0	XXT	19900	3F878	00041	00098	20000	509	
001F4	XXD	19900	00008	00041	00098	00020	210	
001F4	XXD	19900	00008	00041	00098	20000	611	
001F4	XXD	19900	00008	00041	00098	20000	653	
001F4	XXD	19900	00009	00041	00098	20000	510	
001F4	XXD	19900	00508	00041	00098	20040	407	
001F4	XXD	19900	00A88	00041	00098	20040	407	
001F4	XXD	19900	3F878	00041	00098	20000	509	
001F4	XXM	19900	00008	00041	00098	00020	210	
001F4	XXM	19900	00008	00041	00098	20000	203	
001F4	XXM	19900	00008	00041	00098	20000	209	
001F4	XXM	19900	00008	00041	00098	20000	225	
001F4	XXM	19900	00008	00041	00098	20000	243	
001F4	XXM	19900	00008	00041	00098	20000	247	
001F4	XXM	19900	00008	00041	00098	20000	253	
001F4	XXM	19900	00008	00041	00098	20000	255	
001F4	XXM	19900	00008	00041	00098	20000	306	
001F4	XXM	19900	00008	00041	00098	20000	309	
001F4	XXM	19900	00008	00041	00098	20000	512	
001F4	XXM	19900	00009	00041	00098	20000	510	
001F4	XXM	19900	3F878	00041	00098	20000	509	
001F4	XXM	19908	00008	00043	00000	00020	203	
001F4	XXT	19900	00008	00041	00098	00020	210	
001F4	XXT	19900	00008	00041	00098	20000	203	
001F4	XXT	19900	00008	00041	00098	20000	653	
001F4	XXT	19900	00008	00041	00098	20000	602	X
001F4	XXT	19900	00008	00041	00098	20000	611	X
001F4	XXT	19900	00009	00041	00098	20000	510	
001F4	XXT	19900	3F878	00041	00098	20000	509	
001F8	XXD	19900	00008	00040	00000	00020	652	
001F8	XXD	19900	00008	00040	00000	20000	601	X

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD	
001F8	XXD	19900	00008	00041	000A8	20020	515		
001F8	XXM	19900	00008	00000	000A8	1C020	312		
001F8	XXM	19900	00008	00041	000A8	00020	210		
001F8	XXM	19900	00008	00041	000A8	00020	211		
001F8	XXM	19900	00008	00041	000A8	00020	243		
001F8	XXM	19900	00008	00041	000A8	00020	293		
001F8	XXM	19900	00008	00041	000A8	18020	312		
001F8	XXM	19900	00008	00041	000A8	1C020	312		
001F8	XXM	19900	00008	00041	000A8	20020	314		
001F8	XXM	19900	00008	00041	000A8	20020	515		
001F8	XXT	19900	00008	00041	000A8	20020	515		
001FC	XXD	19900	00008	00041	000C8	20000	515		X
001FC	XXM	19900	00008	00041	000C8	20000	306		
001FC	XXM	19900	00008	00041	000C8	20000	309		
001FC	XXM	19900	00008	00041	000C8	20000	309		X
001FC	XXM	19900	00008	00041	000C8	20000	515		X
001FC	XXT	19900	00008	00041	000C8	20000	515		X
002AE	XXT	19900	0C00B	00041	000AA	20000	616		
002AE	XXT	19900	0C00B	00041	000AA	20000	620		
002CA	X M X	0000C	00014	307D8	00000	00078	502		
002CA	X T X	0000C	00014	307D8	00000	00078	502		
0037C	X M X	047F0	0200B	00001	00378	20000	214		
00394	X T X	3D203	0080C	00000	00393	20020	415		
003B8	XXM	19900	00008	00041	00200	20000	216		
003CE	X T X	CYCLE	0080C	00000	CYCLE	20040	506		
003F0	X T X	1F630	0000D	00000	003F1	CYCLE	417		
00400	M X	00000		000C2	20000		607		X
00400	M X	00000	01A03	00002	018E1	20000	607		
00400	M X	00000	02003	00002	000C1	20000	419		
00400	M X	00000	02003	00002	000C1	20000	503		
00400	M X	00000	04003	00002	000C0	00020	515		X

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD	
00400	M X	00000	08003	00002	000C0	20000	515		X
00400	M X	00000	08003	00002	000C0	20000	607		X
00400	M X	00000	08003	00002	000C0	20000	612		X
00400	M X	00000	08003	00002	000C1	20000	624		X
00400	M X	00000	08003	00002	000C5	20000	607		X
00400	M X	00000	0E003	00002	000C1	20000	518		
00400	M X	00000	0E003	00002	000C4	20000	290		
00400	M X	00000	0E003	00002	000C4	20000	290		
00400	M X	00000	12000	00002	000C5	20000	607		X
00400	M X	20000	02003	00002	000C0	20000	515		
00400	M X	20000	02003	00002	000C0	20000	515		X
00400	M X	20000	02003	00002	000C0	3F800	515		
00400	T X	00000	04003	00002	001E0	00020	515		
00400	T X	00000	08003	00002	001E0	20000	515		
00400	T X	00000	08003	00002	001E0	20000	515		X
00400	T X	00000	08003	00002	001E1	00000	419		
00400	T X	00000	08003	00002	001E1	00000	503		
00400	T X	00000	08003	00042	001E1	00000	419		
00400	T X	00000	0800C	00002	001E0	20000	515		
00400	T X	00000	0E003	00002	001E1	00000	518		
00400	T X	20000	02003	00002	001E0	3F800	515		
00400	XD	00000	08003	00002	00130	20000	612		X
00400	XM	00000	02003	00041	000C1	20000	509		
00400	XM	00000	02003	00042	000C4	20000	301		
00400	XM	00000	02003	00042	000C5	20000	155		
00400	XM	00000	08003	00002	000C2	20000	612		X
00400	XM	19900	0200B	00040	00904	20004	214		
00400	XM	19900	0200B	00040	00904	20004	225		
00400	XM	19900	0200B	00040	00904	20004	226		
00400	XM	19900	0200B	00040	00904	20004	287		
00400	XM	19900	0200B	00040	00904	20004	413		
00400	XM	19900	0200B	00040	00904	20004	500		

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00400	XM	19900	0200B	00040	00904	20004	503	
00400	XM	19900	0200B	00040	00A0A	20000	213	
00400	XM	19900	0200B	00040	00A0A	20000	226	
00400	XT	00000	08003	00002	001E1	20000	612	X
00400	XT	00000	08003	00041	001E1	20000	509	
00400	XT	19900	0800B	00040	00904	20004	214	
00400	XT	19900	0800B	00040	00904	20004	413	
00400	XT	19900	0800B	00040	00904	20004	500	
00400	XT	19900	0800B	00040	00904	20004	503	
00400	XT	19900	0800B	00040	00A0A	20000	213	
00400	X M X	00000	08003	00002	000C0	20000	607	X
00402	M X	19900	02003	00000	000C1	20000	402	
00402	T X	19900	08003	00000	001E1	20000	402	
00402	XM	19900	02007	00041	00402	20004	203	
00402	XM	19900	02007	00041	00A0A	20000	203	
00402	XM	19900	0200B	00040	00904	20004	505	
00402	XM	19900	0200B	00040	00A0A	20000	214	
00402	XM	19900	0200B	00040	00A0A	20000	503	
00402	XT	19900	08007	00041	00402	20004	203	
00402	XT	19900	08007	00041	00A0A	20000	203	
00402	XT	19900	0800B	00040	00904	20004	505	
00402	XT	19900	0800B	00040	00A0A	20000	214	
00402	XT	19900	0800B	00040	00A0A	20000	503	
00404	M X	19900	0100B	00000	000C2	20000	500	
00404	M X	19900	02003	00000	000C1	20000	500	
00404	M X	19900	0200B	00000	000C2	20000	500	
00404	M X	19900	0200B	00000	000C4	20000	516	
00404	M X	19900	0200B	00000	00A0A	00000	502	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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00404	M	X	19900	0200B	00000	00A0A	20000	500
00404	M	X	19900	0200B	00000	00A0A	20000	502
00404	M	X	19900	0200B	00000	00A0A	20000	503
00404	M	X	19900	0200B	00200	00A0A	20000	502
00404	M	X	19900	0200B	04000	00A0A	20000	509
00404	M	X	19900	0200B	04000	00A0A	20000	518
00404	M	X	1DDDD	0002E	00000	004F3	25800	215
00404	T	X	19900	08003	00000	001E1	20000	500
00404	T	X	19900	0800B	00000	001E0	20000	516
00404	T	X	19900	0800B	00000	001E1	20000	500
00404	T	X	19900	0800B	00000	00A0A	20000	500
00404	T	X	19900	0800B	00000	00A0A	20000	502
00404	T	X	19900	0800B	00000	00A0A	20000	503
00404	T	X	19900	0800B	00000	00A0A	20000	518
00404	T	X	19900	0800B	00200	00A0A	20000	502
00404	T	X	19900	0800B	04000	00A0A	20000	509
00404	XD		19900	00008	00040	00000	20000	651
00404	XD		19900	00008	00040	00000	20004	651
00404	XD		19900	00008	00040	00440	20004	652
00404	XD		19900	00008	00041	0000A	20000	617
00404	XD		19900	08008	00040	00A0A	20000	406
00404	XM		19900	00008	00040	00A0A	20000	212
00404	XM		19900	00008	00040	00A0A	20000	214
00404	XM		19900	00008	00040	00A0A	20000	313
00404	XM		19900	00008	00040	00A0A	20000	500
00404	XM		19900	00008	00040	00A0A	20000	505
00404	XM		19900	00008	00041	01414	0C020	162
00404	XM		19900	0000B	00060	0020A	20000	518
00404	XM		19900	02000	00040	00A0A	20000	161
00404	XM		19900	02008	00040	00A0A	20000	162
00404	XM		19900	02008	00040	00A0A	20000	295

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00404	XM	19900	02008	00040	00A0A	20000	406	
00404	XM	19900	02008	00040	00A0A	20000	507	
00404	XM	19900	02008	00040	00A0A	20000	510	
00404	XM	19900	02008	00040	00A0A	20000	513	
00404	XM	19900	02008	00040	00A0A	20004	295	
00404	XM	19900	02008	00041	00A0A	20000	203	
00404	XM	19900	02008	00041	00A0A	20000	510	
00404	XM	19900	02008	00041	00A0A	20000	517	
00404	XM	19900	02009	00040	00A0A	20000	240	
00404	XM	19900	02009	00040	00A0A	20000	250	
00404	XM	19900	02009	00040	00A0A	20000	507	
00404	XM	19900	02009	00040	00A0A	20000	511	
00404	XM	19900	02009	00040	00A0A	20000	517	
00404	XM	19900	0200A	00040	00A0A	20000	240	
00404	XM	19900	0200A	00040	00A0A	20000	513	
00404	XM	19900	0200B	00000	000C1	20000	500	
00404	XM	19900	0200B	00040	00000	20000	115	
00404	XM	19900	0200B	00040	00000	20000	153	
00404	XM	19900	0200B	00040	00000	20000	161	
00404	XM	19900	0200B	00040	00000	20000	286	
00404	XM	19900	0200B	00040	00000	20000	292	
00404	XM	19900	0200B	00040	00000	20000	312	
00404	XM	19900	0200B	00040	00000	20000	402	
00404	XM	19900	0200B	00040	00000	20000	505	
00404	XM	19900	0200B	00040	0080A	20000	247	
00404	XM	19900	0200B	00040	00A00	20000	285	
00404	XM	19900	0200B	00040	00A00	20000	288	
00404	XM	19900	0200B	00040	00A00	20000	289	
00404	XM	19900	0200B	00040	00A00	20000	290	
00404	XM	19900	0200B	00040	00A00	20000	313	
00404	XM	19900	0200B	00040	00A00	20004	288	
00404	XM	19900	0200B	00040	00A02	20000	253	
00404	XM	19900	0200B	00040	00A02	20000	255	
00404	XM	19900	0200B	00040	00A08	20000	253	
00404	XM	19900	0200B	00040	00A08	20000	255	
00404	XM	19900	0200B	00040	00A0A	20000	155	X
00404	XM	19900	0200B	00040	00A0A	20000	315	X

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00404	XM	19900	0200B	00040	00A0A	20000	515	X
00404	XM	19900	0200B	00040	00A0B	20000	286	
00404	XM	19900	0200B	00040	00A0B	20001	517	
00404	XM	19900	0200B	00040	00A0E	20000	216	
00404	XM	19900	0200B	00040	00A0E	20000	292	
00404	XM	19900	0200B	00040	00A0E	20000	517	
00404	XM	19900	0200B	00040	00A14	20000	289	
00404	XM	19900	0200B	00040	00A1A	20000	248	
00404	XM	19900	0200B	00040	00A2A	20004	248	
00404	XM	19900	0200B	00040	00A4A	20000	215	
00404	XM	19900	0200B	00040	00A4A	20000	248	
00404	XM	19900	0200B	00040	00A8A	20004	243	
00404	XM	19900	0200B	00040	00A8A	20004	248	
00404	XM	19900	0200B	00040	00A8A	20004	285	
00404	XM	19900	0200B	00040	00A9A	00024	215	
00404	XM	19900	0200B	00040	00A9A	20000	285	
00404	XM	19900	0200B	00040	00AAA	20004	291	
00404	XM	19900	0200B	00040	00ACA	20000	286	
00404	XM	19900	0200B	00040	00ACA	20000	292	
00404	XM	19900	0200B	00040	00ACB	20000	507	
00404	XM	19900	0200B	00040	00ACE	20000	312	
00404	XM	19900	0200B	00040	00AFA	20000	288	
00404	XM	19900	0200B	00040	00B0A	20000	242	
00404	XM	19900	0200B	00040	00B0A	20000	247	
00404	XM	19900	0200B	00040	0140A	20000	289	
00404	XM	19900	0200B	00040	01A0A	20000	215	
00404	XM	19900	0200B	00040	0240A	20000	289	
00404	XM	19900	0200B	00040	02A0A	20000	215	
00404	XM	19900	0200B	00040	04A0A	20000	215	
00404	XM	19900	0200B	00040	05000	20000	507	
00404	XM	19900	0200B	00040	05000	20000	510	

D1	LSURL	B1	C1	C3	D2	D3	FIG LOAD
00404	XM	19900	0200B	00040	05ADA	20000	285
00404	XM	19900	0200B	00040	05ADA	20000	312
00404	XM	19900	0200B	00040	08A0A	20000	215
00404	XM	19900	0200B	00040	0DFF0	00020	312
00404	XM	19900	0200B	00040	0FFF0	00020	312
00404	XM	19900	0200B	00041	00000	00018	503
00404	XM	19900	0200B	00041	00000	20000	153
00404	XM	19900	0200B	00041	00000	20000	161
00404	XM	19900	0200B	00041	00000	20000	225
00404	XM	19900	0200B	00041	00000	20000	285
00404	XM	19900	0200B	00041	00000	20000	288
00404	XM	19900	0200B	00041	00000	20000	289
00404	XM	19900	0200B	00041	00000	20000	312
00404	XM	19900	0200B	00041	00000	20000	315
00404	XM	19900	0200B	00041	00000	20000	405
00404	XM	19900	0200B	00041	00000	20000	500
00404	XM	19900	0200B	00041	00000	20000	502
00404	XM	19900	0200B	00041	00000	20000	508
00404	XM	19900	0200B	00041	0000A	20000	289
00404	XM	19900	0200B	00041	0000A	20000	290
00404	XM	19900	0200B	00041	0000A	20000	304
00404	XM	19900	0200B	00041	0000A	20000	313
00404	XM	19900	0200B	00041	0000A	20000	315
00404	XM	19900	0200B	00041	0000A	20000	404
00404	XM	19900	0200B	00041	0000A	20000	508
00404	XM	19900	0200B	00041	00A10	20000	509
00404	XM	19900	0200B	00041	00E0A	20000	247
00404	XM	19900	0200B	00041	00E4E	20000	212
00404	XM	19900	0200B	00041	00F0F	20000	288
00404	XM	19900	0200B	00041	01414	20000	506
00404	XM	19900	0200B	00041	04A0A	20000	215
00404	XM	19900	0200B	10080	0020A	20004	247
00404	XM	19900	0200B	10080	00A0F	20000	292
00404	XM	19900	0230B	00040	00A0E	20040	203
00404	XM	19900	0230B	00040	00A0E	20040	509

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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00404	XM	19900	0230B	00040	00A0E	20040	517
00404	XM	19900	0230B	00041	00A10	20040	203
00404	XM	19900	0230B	00041	00A10	20040	509
00404	XM	19900	08008	00040	00A0A	20000	213
00404	XM	19900	0800A	00040	00A0A	20000	505
00404	XM	19900	0800B	00040	00A1A	20000	215
00404	XM	19900	0800B	00040	00A2A	20004	215
00404	XM	19900	0E008	00040	00A0A	00020	211
00404	XM	19902	0200B	00040	00A08	20000	288
00404	XM	39900	0200B	00040	00A0A	20000	505
00404	XM	39900	02009	00040	00A0A	20000	203
00404	XT	19900	00008	00040	00000	00004	651
00404	XT	19900	00008	00040	00440	20004	652
00404	XT	19900	00008	00040	00A0A	20000	213
00404	XT	19900	00008	00040	00A0A	20000	214
00404	XT	19900	00008	00040	00A0A	20000	500
00404	XT	19900	00008	00040	00A0A	20000	505
00404	XT	19900	00008	00041	00A0A	00020	651
00404	XT	19900	00009	00040	00A0A	20000	650
00404	XT	19900	0000B	00060	0030A	20000	518
00404	XT	19900	08008	00040	00A0A	20000	406
00404	XT	19900	08008	00040	00A0A	20000	507
00404	XT	19900	08008	00040	00A0A	20000	510
00404	XT	19900	08008	00040	00A0A	20000	513
00404	XT	19900	08008	00041	00A0A	20000	203
00404	XT	19900	08008	00041	00A0A	20000	510
00404	XT	19900	08008	00041	00A0A	20000	517
00404	XT	19900	08009	00040	00A0A	20000	203
00404	XT	19900	08009	00040	00A0A	20000	507
00404	XT	19900	08009	00040	00A0A	20000	511
00404	XT	19900	08009	00040	00A0A	20000	517

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00404	XT	19900	0800A	00040	00A0A	20000	505	
00404	XT	19900	0800A	00040	00A0A	20000	513	
00404	XT	19900	0800B	00040	00000	00000	402	
00404	XT	19900	0800B	00040	00000	20000	507	
00404	XT	19900	0800B	00040	00080	20000	507	
00404	XT	19900	0800B	00040	00192	20000	507	
00404	XT	19900	0800B	00040	00A0B	20004	517	
00404	XT	19900	0800B	00040	00A0E	20000	517	
00404	XT	19900	0800B	00040	00A1A	20000	215	
00404	XT	19900	0800B	00040	00A2A	20004	215	
00404	XT	19900	0800B	00040	00A4A	20000	215	
00404	XT	19900	0800B	00040	00A9A	20004	215	
00404	XT	19900	0800B	00040	00BEB	20000	507	
00404	XT	19900	0800B	00040	02A0A	20004	215	
00404	XT	19900	0800B	00040	04A0A	20000	215	
00404	XT	19900	0800B	00040	050D0	20000	507	
00404	XT	19900	0800B	00040	050D0	20000	510	
00404	XT	19900	0800B	00040	08A0A	20000	215	
00404	XT	19900	0800B	00041	00000	00018	503	
00404	XT	19900	0800B	00041	00000	20000	500	
00404	XT	19900	0800B	00041	00000	20000	502	
00404	XT	19900	0800B	00041	00000	20000	508	
00404	XT	19900	0800B	00041	0000A	20000	508	
00404	XT	19900	0800B	00041	00A10	20000	509	
00404	XT	19900	0800B	00041	01414	00000	506	
00404	XT	19900	0800B	00041	01A0A	20000	215	
00404	XT	19900	0800B	00041	04A0A	20000	215	
00404	XT	19900	0830B	00040	00A0E	20040	509	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00404	XT	19900	0830B	00040	00A0E	20040	517	
00404	XT	19900	0830B	00041	00A10	20040	203	
00404	XT	19900	0830B	00041	00A10	20040	509	
00404	XT	19900	0E00B	00040	00A0A	00020	211	
00404	X T X	19900	0800B	00040	00A0A	20000	607	X
00404	XXD	19900	0000B	00040	00A00	00020	617	
00404	XXD	19900	0000B	00040	00A00	20000	404	
00404	XXD	19900	0000B	00040	00A00	20000	405	
00404	XXD	19900	0000B		00AA0		617	
00404	XXD	19900	00300	00041	00A0A	20040	517	
00404	XXD	19900	33848	00040	00A0A	20000	210	
00404	XXM	19900	00000	00040	00A0A	20000	150	
00404	XXM	19900	00000	00040	00A0A	20000	151	
00404	XXM	19900	00000	00040	00A0A	20000	156	
00404	XXM	19900	00000	00040	00A0A	20000	301	
00404	XXM	19900	00004	00040	00A0A	20000	312	
00404	XXM	19900	0000B	00040	00A00	20000	404	
00404	XXM	19900	0000B	00040	00A00	20000	405	
00404	XXM	19900	0000B	00040	00A0A	20000	213	
00404	XXM	19900	0000B	00040	00A0A	20000	285	
00404	XXM	19900	0000B	00040	00A0A	20000	286	
00404	XXM	19900	0000B	00040	00A0A	20000	294	
00404	XXM	19900	0000B	00040	00A0A	3C000	292	
00404	XXM	19900	0000A	00040	00A0A	20000	248	
00404	XXM	19900	00300	00041	00A0A	20040	517	
00404	XXM	19900	0200B	00041	0000A	20000	150	
00404	XXM	19900	0E00B	00040	00A0A	3C000	286	
00404	XXM	19900	33848	00040	00A0A	20000	210	
00404	XXM	19900	33848	00040	00A0A	20000	225	
00404	XXT	19900	0000B	00040	00A00	00020	617	
00404	XXT	19900	0000B	00040	00A00	20000	401	
00404	XXT	19900	0000B	00040	00A00	20000	404	
00404	XXT	19900	0000B	00040	00A00	20000	405	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAn
00404	XXT	19900	00300	00041	00A0A	20040	517	
00404	XXT	19900	33848	00040	00A0A	20000	210	
00405	XM	19900	0200B	00040	00A0A	20000	214	
00405	XM	19900	0200B	00040	00A0A	20000	217	
00405	XM	19900	0200B	00040	00A0A	20000	226	
00405	XM	19900	0200B	00040	00A0A	20000	402	
00405	XM	19900	0200B	00040	00A0A	20000	508	
00405	XM	19900	0200B	00040	00A0A	20000	214	XX
00405	XM	19900	0200B	00040	00A0B	20000	249	
00405	XM	19900	0200B	00040	00A0B	20000	253	
00405	XM	19900	0200B	00040	00A0B	20001	512	
00405	XM	19900	0800B	00040	00A0A	20000	402	
00405	XT	19900	0800B	00040	00A0A	20000	214	
00405	XT	19900	0800B	00040	00A0A	20000	402	
00405	XT	19900	0800B	00040	00A0A	20000	508	
00405	XT	19900	0800B	00040	00A0B	20001	512	
00405	XXD	19900	0000B	00040	00A0A	20000	516	
00405	XXM	19900	0000B	00040	00A0A	20000	516	
00405	XXT	19900	0000B	00040	00A0A	20000	516	
00406	XM	19900	0200B	00040	00A0A	20000	214	
00406	XM	19900	0200B	00040	00A0A	20000	225	
00406	XM	19900	0200B	00040	00A0A	20000	226	
00406	XM	19900	0200B	00040	00A0A	20000	287	
00406	XT	19900	0800B	00040	00A0A	20000	214	
00406	XT	19900	0E00F	00040	00A0B	20000	203	
00408	M X	0071D	02007	00000	00408	20000	239	
00408	X D X	04780	00008	00005	0042C	20008	517	
00408	X D X	04780	00008	04000	1042C	20000	503	
00408	X D X	04780	00008	04000	1042C	20000	511	
00408	X M X	0078D	00004	00000	00408	20000	226	
00408	X M X	04780	00008	00005	0042C	20008	517	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAn
00408	X	M	X	04780	00008	04000	1042C	20000 503
00408	X	M	X	04780	00008	04000	1042C	20000 511
00408	X	T	X	04780	00008	00005	0042C	20008 517
00408	X	T	X	04780	00008	04000	1042C	20000 503
00408	X	T	X	04780	00008	04000	1042C	20000 511
00408	XXM			19900	02008	00040	0042C	20000 225
00408	XXM			19900	02008	00040	0042C	20000 226
0040A	D	X		0070D	00007	00000	00404	20000 405
0040A	D	X		0070D	08007	00000	00404	20000 405
0040A	D	X		0070D	08007	00000	00404	20000 406
0040A	D	X		0070D	0800D	00000	00404	20000 406
0040A	D	X		0070D	08047	00000	00408	22000 653
0040A	M	X		006FD	02005	00000	00408	06003 312
0040A	M	X		0070D	02007	00000	00404	20000 254
0040A	M	X		0070D	02007	00000	00404	20000 405
0040A	M	X		0070D	02007	00000	00408	20000 203
0040A	M	X		0070D	02007	00000	00408	20000 212
0040A	M	X		0070D	02007	00000	00408	20000 213
0040A	M	X		0070D	02007	00000	00408	20000 301
0040A	M	X		0070D	02017	00000	00408	20000 246
0040A	M	X		0070D	02047	00000	00404	20000 506
0040A	M	X		0070D	02047	00000	00408	20000 253
0040A	M	X		0070D	08007	00000	00404	20000 406
0040A	M	X		0070D	08007	00000	00408	20000 203
0040A	M	X		0070D	0800D	00000	00404	20000 406
0040A	T	X		0070D	08007	00000	00404	20000 401
0040A	T	X		0070D	08007	00000	00404	20000 403
0040A	T	X		0070D	08007	00000	00404	20000 405
0040A	T	X		0070D	08007	00000	00404	20000 406
0040A	T	X		0070D	08007	00000	00404	20000 506
0040A	T	X		0070D	08007	00000	00408	20000 203
0040A	T	X		0070D	08007	00000	00408	20000 213

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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0040A	T	X	0070D	0800D	00000	00404	20000	406
0040A	T	X	0070D	08047	00000	00408	22000	653
0040A	T	X	1870D	09007	00000	00408	20000	651
0040A	XM		0078D	00004	00001	00408	00020	210
0040A	X	D	X	0058D	00004	00000	00408	20000 660
0040A	X	D	X	0078D	00004	00000	00408	20000 215
0040A	X	D	X	0078D	00004	00000	00408	20000 652
0040A	X	D	X	0078D	00004	00000	00408	20000 660
0040A	X	D	X	0078D	00004	00001	00408	20000 203
0040A	X	D	X	0078D	00004	00001	00408	20000 210
0040A	X	D	X	0078D	00005	04000	0074D	20000 403
0040A	X	M	X	0078D	00004	00000	00408	20000 212
0040A	X	M	X	0078D	00004	00000	00408	20000 215
0040A	X	M	X	0078D	00004	00000	00408	20000 248
0040A	X	M	X	0078D	00004	00000	00408	20000 252
0040A	X	M	X	0078D	00004	00000	00408	20000 255
0040A	X	M	X	0078D	00004	00000	00408	20000 272
0040A	X	M	X	0078D	00004	00000	00408	20000 285
0040A	X	M	X	0078D	00004	00000	00408	20000 288
0040A	X	M	X	0078D	00004	00000	00408	20000 289
0040A	X	M	X	0078D	00004	00001	00408	00020 210
0040A	X	M	X	0078D	00004	00001	00408	20000 203
0040A	X	M	X	0078D	00004	00001	00408	20000 210
0040A	X	M	X	0078D	00004	00001	00408	20000 225
0040A	X	M	X	0078D	00005	04000	0074D	20000 403
0040A	X	M	X	00E8D	00004	00000	00408	20000 252
0040A	X	T	X	0058D	00004	00000	00408	20000 660
0040A	X	T	X	0078D	00004	00000	00408	20000 215
0040A	X	T	X	0078D	00004	00000	00408	20000 652
0040A	X	T	X	0078D	00004	00000	00408	20000 660
0040A	X	T	X	0078D	00004	00001	00408	20000 203
0040A	X	T	X	0078D	00004	00001	00408	20000 210
0040A	X	T	X	0078D	00005	04000	0074D	20000 403
0040B	M	X	0070D	0201E	00000	00409	20000	246
0040B	X	D	X	3FC31	0080C	00000	00002	20000 401

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0040B	X	D	X	3FC31	0080C	00000	000FF	20000 416
0040B	X	D	X	3FC31	0080C	00000	02418	20000 401
0040B	X	D	X	3FC31	0080C	00000	02418	20001 405
0040B	X	M	X	3FC31	0080C	00000	00002	20000 401
0040B	X	M	X	3FC31	0080C	00000	000FF	20000 416
0040B	X	M	X	3FC31	0080C	00000	02418	20000 313
0040B	X	M	X	3FC31	0080C	00000	02418	20000 401
0040B	X	M	X	3FC31	0080C	00000	02418	20001 405
0040B	X	T	X	3FC31	0080C	00000	00002	20000 401
0040B	X	T	X	3FC31	0080C	00000	000FF	20000 416
0040B	X	T	X	3FC31	0080C	00000	02418	20000 401
0040B	X	T	X	3FC31	0080C	00000	02418	20001 405
0040C	XD			19900	00008	00040	00488	20000 652
0040C	XM			19900	0200B	00040	0042C	20000 225
0040C	XM			19900	0200B	00040	0042C	20000 226
0040C	XM			19900	0200B	00040	0074D	20004 213
0040C	XM			19900	0200B	00040	0074D	20004 226
0040C	XT			19900	00008	00040	00488	20000 652
0040C	XT			19900	0800B	00040	0074D	20004 213
0040E	D	X		0070D	08006	00001	00408	20000 650
0040E	D	X		0070D	08006	00001	00408	20000 660
0040E	D	X		1870D	09007	00708	00408	20000 651
0040E	M	X		0070D	02006	00001	00408	20000 240
0040E	M	X		0070D	02006	00001	00408	20000 250
0040E	M	X		0070D	02007	00000	00408	20000 509
0040E	M	X		0070D	02007	00001	00408	20000 203
0040E	M	X		007CD	00005	00000	00408	20000 310
0040E	T	X		0070D	08006	00000	00408	20000 203
0040E	T	X		0070D	08006	00001	00408	20000 650
0040E	T	X		0070D	08006	00001	00408	20000 656

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0040E	T	X	0070D	08006	00001	00408	20000	660
0040E	T	X	0070D	08007	00000	00408	20000	509
0040E	T	X	0070D	08007	00001	00408	20000	203
0040E	T	X	00E0D	00007	00000	00408	20000	509
0040E	X	D	X	0070D	00002	00000	00408	20000 601
0040E	X	D	X	0070D	00002	00000	00408	20000 609
0040E	X	D	X	0070D	00006	00000	00408	20000 406
0040E	X	D	X	0070D	00006	00000	00408	20000 509
0040E	X	D	X	0070D	00006	00000	00408	20000 513
0040E	X	D	X	0070D	00006	10408	00408	20000 203
0040E	X	D	X	0070D	00007	00000	00408	20000 513
0040E	X	D	X	0070D	00007	00040	00408	20000 517
0040E	X	D	X	007CD	00001	00000	00408	20000 609
0040E	X	D	X	007CD	00005	00000	00408	20000 203
0040E	X	D	X	007CD	00005	00000	00408	20000 406
0040E	X	D	X	007CD	00005	00000	00408	20000 513
0040E	X	D	X	007CD	00005	00000	00408	20000 517
0040E	X	D	X	007CD	00005	00000	00408	20000 650
0040E	X	M	X	0020D	00007	00040	00408	20000 301 x
0040E	X	M	X	0070D	00002	00000	00408	20000 609
0040E	X	M	X	0070D	00006	00000	00408	20000 240
0040E	X	M	X	0070D	00006	00000	00408	20000 247
0040E	X	M	X	0070D	00006	00000	00408	20000 251
0040E	X	M	X	0070D	00006	00000	00408	20000 255
0040E	X	M	X	0070D	00006	00000	00408	20000 310
0040E	X	M	X	0070D	00006	00000	00408	20000 406
0040E	X	M	X	0070D	00006	00000	00408	20000 509
0040E	X	M	X	0070D	00006	00000	00408	20000 513
0040E	X	M	X	0070D	00006	10408	00408	20000 203
0040E	X	M	X	0070D	00007	00000	00408	20000 295
0040E	X	M	X	0070D	00007	00000	00408	20000 301
0040E	X	M	X	0070D	00007	00000	00408	20000 513
0040E	X	M	X	0070D	00007	00000	00408	20000 601
0040E	X	M	X	0070D	00007	00040	00408	20000 517 x
0040E	X	M	X	0070D	02007	00000	00408	20000 153

D1	LSURL	B1	C1	.C3	D2	D3	FIG	LOAD		
0040E	X	M	X	007CD	00001	00000	00408	20000	604	
0040E	X	M	X	007CD	00001	00000	00408	20000	609	
0040E	X	M	X	007CD	00005	00000	00408	20000	203	
0040E	X	M	X	007CD	00005	00000	00408	20000	239	
0040E	X	M	X	007CD	00005	00000	00408	20000	240	
0040E	X	M	X	007CD	00005	00000	00408	20000	250	
0040E	X	M	X	007CD	00005	00000	00408	20000	295	
0040E	X	M	X	007CD	00005	00000	00408	20000	310	
0040E	X	M	X	007CD	00005	00000	00408	20000	406	
0040E	X	M	X	007CD	00005	00000	00408	20000	513	
0040E	X	M	X	007CD	00005	00000	00408	20000	517	
0040E	X	M	X	007CD	00005	00000	00408	20000	604	
0040E	X	M	X	007CD	00005	00000	00408	20000	607	X
0040E	X	M	X	007CD	00408	00000	00408	20000	607	X
0040E	X	T	X	0070D	00002	00000	00408	20000	601	
0040E	X	T	X	0070D	00002	00000	00408	20000	609	
0040E	X	T	X	0070D	00006	00000	00408	20000	406	
0040E	X	T	X	0070D	00006	00000	00408	20000	509	
0040E	X	T	X	0070D	00006	00000	00408	20000	513	
0040E	X	T	X	0070D	00006	10408	00408	20000	203	
0040E	X	T	X	0070D	00007	00000	00408	20000	513	
0040E	X	T	X	0070D	00007	00040	00408	20000	517	X
0040E	X	T	X	007CD	00001	00000	00408	20000	609	
0040E	X	T	X	007CD	00005	00000	00408	20000	203	
0040E	X	T	X	007CD	00005	00000	00408	20000	406	
0040E	X	T	X	007CD	00005	00000	00408	20000	513	
0040E	X	T	X	007CD	00005	00000	00408	20000	517	
0040E	X	T	X	007CD	00005	00000	00408	20000	650	
0040F	XT		19900	0800B	00040	00A0A	20000	214		
00410	D	X	018B0	0830B	00001	0001A	20040	652		
00410	XD		19900	0800B	00040	00001	20004	609		
00410	XD		19900	0800B	00040	00001	20004	652		
00410	XD		19900	0800B	00041	00001	00020	620		
00410	XM		19900	00008	00040	00000	20004	401		
00410	XM		19900	00008	00040	20000	20004	408		

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00410	XM	19900	00008	00041	00001	20000	403	
00410	XM	19900	00008	00041	00011	20000	404	
00410	XT	19900	0800B	00040	00001	20004	609	
00410	XT	19900	0800B	00040	00001	20004	652	
00410	XT	19900	0800B	00041	00001	20000	618	
00410	XT	19900	0800B	00041	00001	20000	620	
00410	XT	19900	0800B	00041	00001	20000	655	
00410	XT	39900	00009	00040	00001	20004	655	
00412	D X	00000	08087	00000	00408	20040	652	
00412	X M X	04701	00008	00000	0040A	20000	285	
00414	XM	19900	0200B	00040	00710	20004	212	
00414	XM	19900	0200B	00040	00710	20004	225	
00414	XM	19900	0200B	00040	00710	20004	226	
00418	X M X	04720	0000A	00001	00416	20000	211	
0041A	M X	0073D	02007	00000	0040C	20000	253	
0041A	T X	0073D	08007	00000	0040C	20000	403	
0041A	T X	1873D	09007	00000	0040C	21000	660	
0041A	XD	0073D	08007	00000	0040C	21000	653	
0041A	XM	19900	00008	00040	00192	20004	507	
0041A	XM	19900	0000A	00040	00000	20004	403	
0041A	XM	19900	0000A	00040	0041A	20004	404	
0041A	XM	19900	0000A	00041	00002	20000	404	
0041A	XT	0073D	08007	00000	0040C	21000	653	
0041A	XT	19900	04004	00040	00002	00000	651	
0041A	X M X	04720	0000A	00001	00416	20000	226	
0041A	X T X	04720	0000A	00001	00416	20000	211	
0041A	XXD	19900	00008	00040	00002	20004	609	
0041A	XXT	19900	00008	00040	00002	20004	609	
0041B	XM	19900	0000A	00040	0000F	20004	404	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0041E	M	X	0079D	02007	00000	00408	20000	213
0041E	T	X	0079D	08007	00000	00408	20000	213
00420	M	X	00A0F	00000	00003	00A0A	00020	272 X
00422	X	D	X	045D0	00008	00000	0041E	20000 511
00422	X	D	X	045D0	08008	00000	0041E	20000 203
00422	X	M	X	00592	00004	00000	00C0C	20000 252
00422	X	M	X	04500	00008	00000	0041E	20000 291
00422	X	M	X	04500	00008	00000	0041E	20000 292
00422	X	M	X	04510	00008	00000	0041E	20000 289
00422	X	M	X	04550	00008	00000	0041E	00020 252
00422	X	M	X	04550	00008	00000	0041E	20000 204
00422	X	M	X	04550	00008	00000	0041E	20000 243
00422	X	M	X	045D0	00008	00000	0041E	20000 211
00422	X	M	X	045D0	00008	00000	0041E	20000 226
00422	X	M	X	045D0	00008	00000	0041E	20000 511
00422	X	M	X	045D0	08008	00000	0041E	20000 203
00422	X	T	X	045D0	00008	00000	0041E	20000 403
00422	X	T	X	045D0	00008	00000	0041E	20000 511
00422	X	T	X	045D0	08008	00000	0041E	20000 203
00423	M	X	045D0	02008	00000	0041F	20000	290
00423	T	X	045D0	08008	00000	0041F	20000	404
00424	XD		19900	00008	00041	00003	20000	652
00424	XM		19900	02008	00040	00710	20004	225
00424	XM		19900	02008	00040	007F0	20000	226
00424	XM		19900	02008	00040	007F0	20000	212 X
00424	XT		19000	00008	00041	00002	00003	655
00424	XT		19900	00008	00040	00003	20000	610
00424	XT		19900	00008	00041	00003	20000	610
00424	XT		19900	00008	00041	00003	20000	652
00424	XT		19900	00008	00041	00003	20000	655
00424	X	D	X	00432	00009	00000	00E00	20000 656

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00424	X	D	X	00432	00009	00000	00E00	20000 660
00424	X	M	X	00432	00008	00000	00E00	20000 239
00424	X	M	X	00432	00009	00000	00E00	20000 272
00424	X	M	X	00432	00009	00000	00F00	20000 250
00424	X	T	X	00432	00009	00000	00E00	20000 660
00425		M	X	00A0F	00000	00003	00A0A	20000 203
00425		T	X	00A0F	00000	00003	00A0A	20000 203
00425	XM			19900	0000A	00040	00003	20004 404
00425	XM			19909	00008	00040	0000C	20004 403
00426	X	D	X	00592	00004	00000	00C0C	20000 652
00426	X	T	X	00592	00004	00000	00C0C	20000 215
00426	X	T	X	00592	00004	00000	00C0C	20000 652
00428		D	X	00A0F	00000	00003	00A0A	00020 660
00428		M	X	00A0F	00000	00002	000C4	20000 214
00428		M	X	00A0F	00000	00002	000C4	20000 253
00428		M	X	00A0F	00000	00002	000C4	20000 313
00428		T	X	00A0F	00000	00002	001E0	20000 214
00428		T	X	00A0F	00000	00003	00A0A	00020 660
00428	X	T	X	00A0F	00000	00002	04E7E	20000 209
0042A		D	X	00A0F	00000	00003	00A0A	00020 656
0042A		D	X	00A0F	00000	00003	00A0A	20000 650
0042A		D	X	00A0F	00020	00002	00130	20800 653
0042A		M	X	00000	00000	00002	000C1	20000 203 X
0042A		M	X	00000	00000	00002	000C1	20000 510 X
0042A		M	X	00000	00000	00002	000C1	20000 511 X
0042A		M	X	00000	00000	00002	000C4	20000 511 X
0042A		M	X	00A0F	00000	00002	00000	20000 203
0042A		M	X	00A0F	00000	00002	00000	20000 313

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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0042A	M	X	00A0F	00000	00002	000C4	20000	214
0042A	M	X	00A0F	00000	00002	000C4	20000	313
0042A	M	X	00A0F	00000	00002	0042B	20000	506
0042A	M	X	00A0F	00000	00002	00A0A	00000	250
0042A	M	X	00A0F	00000	00003	00A0A	00020	239
0042A	M	X	00A0F	00000	00003	00A0A	20000	239
0042A	M	X	00A0F	00000	00003	00A0A	20000	250
0042A	M	X	00A0F	00002	00002	000C4	20000	253
0042A	M	X	00A0F	00010	00002	000C0	20000	505
0042A	M	X	00A0F	00010	00002	000C5	20000	315
0042A	M	X	00A0F	00020	00002	000C4	20000	253
0042A	T	X	00000	00000	00002	001E0	20000	511 X
0042A	T	X	00000	00000	00002	001E1	20000	203 X
0042A	T	X	00000	00000	00002	001E1	20000	510 X
0042A	T	X	00A0F	00000	00002	00000	20000	203
0042A	T	X	00A0F	00000	00002	001E0	20000	214
0042A	T	X	00A0F	00000	00002	001E0	20000	505
0042A	T	X	00A0F	00000	00002	001E1	00000	401
0042A	T	X	00A0F	00000	00002	003D4	20000	506 X
0042A	T	X	00A0F	00000	00003	00A0A	20000	650
0042A	T	X	00A0F	00020	00002	001E1	20800	653
0042A	X	D	X	00A0F	00000	00002	00000	20000 509
0042A	X	D	X	00A0F	00000	00002	00426	20004 203
0042A	X	D	X	00A0F	00000	00003	00A68	00004 506
0042A	X	D	X	00A0F	00000	00020	00F04	20004 507
0042A	X	M	X	00A0F	00000	00002	00000	20000 509
0042A	X	M	X	00A0F	00000	00002	001AA	20000 503
0042A	X	M	X	00A0F	00000	00002	00426	20004 203

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD	
0042A	X	M	X	00A0F	00000	00002	00F04	20004	215
0042A	X	M	X	00A0F	00000	00003	00020	20000	312
0042A	X	M	X	00A0F	00000	00003	00A68	00004	506
0042A	X	M	X	00A0F	00000	00003	00A68	20004	506
0042A	X	M	X	00A0F	00000	00020	00F04	20004	507
0042A	X	T	X	00A0F	00000	00002	00000	20000	509
0042A	X	T	X	00A0F	00000	00002	00004	00020	503 X
0042A	X	T	X	00A0F	00000	00002	00304	20000	506 X
0042A	X	T	X	00A0F	00000	00002	00426	20004	203
0042A	X	T	X	00A0F	00000	00002	00F04	20004	203
0042A	X	T	X	00A0F	00000	00003	00A68	00004	506
0042A	X	T	X	00A0F	00000	00020	00F04	20004	507
0042A	X	T	X	19900	00008	00041	00000	20000	507
0042C	X	D	X	00490	00004	00000	00C01	20000	214
0042C	X	D	X	00490	00004	00000	00C01	20000	401
0042C	X	D	X	00490	00004	00000	00C01	20000	505
0042C	X	M	X	00490	00004	00000	00C01	20000	214
0042C	X	M	X	00490	00004	00000	00C01	20000	313
0042C	X	M	X	00490	00004	00000	00C01	20000	401
0042C	X	M	X	00490	00004	00000	00C01	20000	505
0042C	X	M	X	00490	00004	00000	00EE2	20000	156
0042C	X	T	X	00490	00004	00000	00C01	20000	214
0042C	X	T	X	00490	00004	00000	00C01	20000	401
0042C	X	T	X	00490	00004	00000	00C01	20000	500
0042C	X	T	X	00490	00004	00000	00C01	20000	505
0042D	X	T	X	00490	00004	00001	00C01	20000	505
0042E	XD			19900	00008	00041	00004	20000	605
0042E	XD			19900	0000A	00040	00004	00020	651
0042E	XD			19900	0000A	00040	00004	20004	609
0042E	XD			19900	0000A	00040	00004	20004	613
0042E	XD			19900	0000A	00041	00004	00020	651

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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0042E	XD	19900	0000A	00041	00004	10000	650	
0042E	XD	19900	0000A	00041	00004	20000	603	
0042E	XD	19900	0000A	00041	00004	20000	605	
0042E	XD	19900	0000A	00041	00004	20000	608	
0042E	XD	19900	0000A	00041	00004	20000	609	
0042E	XD	19900	0000A	00041	00004	20000	610	
0042E	XD	19900	0000A	00041	00004	20000	611	
0042E	XD	19900	0000A	00041	00004	20000	613	
0042E	XD	19900	0000A	00041	00004	20000	615	
0042E	XD	19900	0000A	00041	00004	20000	618	
0042E	XD	19900	0000A	00041	00004	20000	620	
0042E	XD	19900	0000A	00041	00004	20000	624	
0042E	XD	19900	0000A	00041	00004	20000	650	
0042E	XD	19900	0000A	00041	00004	20000	651	
0042E	XD	19900	0000A	00041	00004	20000	652	
0042E	XD	19900	0000A	00041	00004	20000	653	
0042E	XD	19900	0000A	00041	00004	20000	654	
0042E	XD	19900	0000A	00041	00004	20000	658	
0042E	XD	19900	0000A	00041	00004	20000	605	X
0042E	XD	19900	0000A	00041	00004	20000	650	XX
0042E	XD	19900	0000A	00041	00004	24800	617	
0042E	XD	19900	18008		04100	00020	650	
0042E	XM	19900	00008	00040	00014	20000	407	
0042E	XM	19900	0000A	00041	00004	20000	403	
0042E	XM	19900	0000A	00041	00004	20000	404	
0042E	XT	19900	00004	00041	00004	20000	620	
0042E	XT	19900	00008	00041	00004	20000	610	
0042E	XT	19900	0000A	00040	00004	00020	654	
0042E	XT	19900	0000A	00040	00004	20004	609	
0042E	XT	19900	0000A	00041	00004	00020	618	
0042E	XT	19900	0000A	00041	00004	00020	651	
0042E	XT	19900	0000A	00041	00004	14800	617	
0042E	XT	19900	0000A	00041	00004	20000	603	
0042E	XT	19900	0000A	00041	00004	20000	605	
0042E	XT	19900	0000A	00041	00004	20000	608	
0042E	XT	19900	0000A	00041	00004	20000	609	
0042E	XT	19900	0000A	00041	00004	20000	610	
0042E	XT	19900	0000A	00041	00004	20000	611	
0042E	XT	19900	0000A	00041	00004	20000	613	
0042E	XT	19900	0000A	00041	00004	20000	615	
0042E	XT	19900	0000A	00041	00004	20000	616	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0042E	XT	19900	0000A	00041	00004	20000	617	
0042E	XT	19900	0000A	00041	00004	20000	618	
0042E	XT	19900	0000A	00041	00004	20000	620	
0042E	XT	19900	0000A	00041	00004	20000	624	
0042E	XT	19900	0000A	00041	00004	20000	650	
0042E	XT	19900	0000A	00041	00004	20000	651	
0042E	XT	19900	0000A	00041	00004	20000	652	
0042E	XT	19900	0000A	00041	00004	20000	653	
0042E	XT	19900	0000A	00041	00004	20000	654	
0042E	XT	19900	0000A	00041	00004	20000	655	
0042E	XT	19900	0000A	00041	00004	20000	605	X
0042E	XT	19900	0000A	00041	00004	20000	603	X
0042E	XT	19900	0000A	00041	00004	20000	614	X
0042E	XT	19900	0000A	00041	0000A	20000	620	
0042E	XT	1D9F0	00008	00041	004b1	00020	651	
0042E	X D X	00430	00004	00000	00EC6	00000	402	
0042E	X M X	00430	00004	00000	00EC6	00000	402	
0042E	X M X	00430	00004	00000	00EC6	20000	212	
0042E	X M X	00430	00004	00000	00EC6	20000	226	
0042E	X M X	00480	00004	00000	00EE6	20000	226	
0042E	X T X	00430	00004	00000	00EC6	00000	402	
0042E	XXM	19900	18008	00040	004DE	00024	650	X
00430	X D X	00771	00004	00000	00444	20000	502	
00430	X D X	00771	00004	00000	00444	20000	503	
00430	X D X	00771	00004	00000	00F04	20000	502	
00430	X D X	00771	00004	04000	00F04	20000	511	
00430	X M X	00771	00004	00000	00444	20000	502	
00430	X M X	00771	00004	00000	00444	20000	503	
00430	X M X	00771	00004	00000	00F04	20000	502	
00430	X M X	00771	00004	04000	00F04	20000	511	
00430	X T X	00771	00004	00000	00444	20000	502	
00430	X T X	00771	00004	00000	00444	20000	503	
00430	X T X	00771	00004	00000	00F04	20000	502	
00430	X T X	00771	00004	04000	00F04	20000	511	
00432	X D X	00782	00004	00000	00430	20000	506	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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00432	X	D	X	00790	00084	00000	0042C	20040 516
00432	X	M	X	00782	00004	00000	00430	20000 506
00432	X	M	X	00790	00084	00000	0042C	20040 516
00432	X	T	X	00782	00004	00000	00430	20000 506
00432	X	T	X	00790	00084	00000	0042C	20040 516
00436		M	X	00484	02006	00000	00C58	20000 248
00438	XD			19927	0000A	00041	000A0	20000 609
00438	XD			19927	0000A	00041	000A0	20000 653
00438	XT			19927	0000A	00041	000A0	20000 609
00438	XT			19927	0000A	00041	000A0	20000 653
00444	XD			19940	0800B	00040	00480	30000 652
00444	XM			19900	0200B	00040	00440	20004 211
00444	XM			19900	0200B	00040	00440	20004 226
00444	XM			19900	0200B	00040	00440	20004 248
00444	XM			19900	0800B	00040	00460	20004 252
00444	XM			19940	0200B	00040	00480	20000 243
00444	XM			19940	0200B	00040	00A4A	10020 252
00444	XT			19900	0800B	00040	00440	20004 211
00444	XXD			19900	00008	00040	00440	20004 203
00444	XXD			19900	00009	00040	00440	20004 203
00444	XXD			19900	0000A	00040	00440	20004 203
00444	XXD			1B900	00008	00040	00440	20004 203
00444	XXM			19900	00008	00040	00440	20004 203
00444	XXM			19900	00009	00040	00440	20004 203
00444	XXM			19900	0000A	00040	00440	20004 203
00444	XXM			1B900	00008	00040	00440	20004 203
00444	XXT			19900	00008	00040	00440	20004 203
00444	XXT			19900	00009	00040	00440	20004 203
00444	XXT			19900	0000A	00040	00440	20004 203

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00444	XXT	1B900	00008	00040	00440	20004	203	
00446	XT	19900	0E00C	00040	0043F	20000	203	
00446	XT	39940	0000B	00040	00046	30000	652	
0044C	XM	39900	02008	00041	0C918	00000	286	
0044C	XAD	39900	00008	00040	00448	00004	502	
0044C	XAD	39900	00008	00040	00448	20000	511	
0044C	XAD	39900	00008	00040	00448	20000	517	
0044C	XAD	39900	00008	00040	00448	20004	403	
0044C	XAD	39900	00008	00040	00448	20004	506	
0044C	XAD	39900	00008	00040	00448	20004	510	
0044C	XAD	39900	00008	00040	00448	20004	511	
0044C	XAD	39900	00008	00040	00448	20004	517	
0044C	XXM	19920	00008	00040	00448	20004	204	
0044C	XXM	39900	00008	00040	00448	00004	502	
0044C	XXM	39900	00008	00040	00448	20000	511	
0044C	XXM	39900	00008	00040	00448	20000	517	
0044C	XXM	39900	00008	00040	00448	20004	288	
0044C	XXM	39900	00008	00040	00448	20004	403	
0044C	XXM	39900	00008	00040	00448	20004	506	
0044C	XXM	39900	00008	00040	00448	20004	510	
0044C	XXM	39900	00008	00040	00448	20004	511	
0044C	XXM	39900	00008	00040	00448	20004	517	
0044C	XXT	39900	00008	00040	00448	00004	502	
0044C	XXT	39900	00008	00040	00448	20000	511	
0044C	XXT	39900	00008	00040	00448	20000	517	
0044C	XXT	39900	00008	00040	00448	20004	403	
0044C	XXT	39900	00008	00040	00448	20004	506	
0044C	XXT	39900	00008	00040	00448	20004	510	
0044C	XXT	39900	00008	00040	00448	20004	511	
0044C	XXT	39900	00008	00040	00448	20004	517	
00450	XM	19900	02008	00040	0045C	20000	252	
00450	XAD	19900	00008	00040	0044C	20004	215	
00450	XAD	19900	00008	00040	0044C	20004	652	
00450	XAD	19900	0000A	00040	0044C	20004	504	
00450	XXM	19900	00008	00040	0044C	20004	215	
00450	XXM	19900	00008	00040	0044C	20004	244	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00450	XXM	19900	00008	00040	0044C	20004	252	
00450	XXM	19900	0000A	00040	0044C	00024	312	
00450	XXM	19900	0000A	00040	0044C	20004	504	
00450	XXM	19903	00008	00040	00450	20004	291	
00450	XXT	19900	00008	00040	0044C	20004	215	
00450	XXT	19900	00003	00040	0044C	20004	652	
00450	XXT	19900	0000A	00040	0044C	20004	504	
00454	XXL	19900	0000A	00040	00450	20004	507	
00454	XXM	19900	00008	00040	00450	20004	285	
00454	XXM	19900	00008	00040	00450	20004	286	
00454	XXM	19900	0000A	00040	00450	20004	288	
00454	XXM	19900	0000A	00040	00450	20004	507	
00454	XXT	19900	0000A	00040	00450	20004	507	
00455	XXM	19901	00008	00040	00452	20004	246	
00458	XXD	19900	00008	00040	00454	20004	653	
00458	XXD	19900	00009	00040	00454	20004	507	
00458	XXM	19900	00009	00040	00454	20004	225	
00458	XXM	19900	00009	00040	00454	20004	288	
00458	XXM	19900	00009	00040	00454	20004	291	
00458	XXM	19900	00009	00040	00454	20004	292	
00458	XXM	19900	00009	00040	00454	20004	507	
00458	XXM	39900	00009	00040	00454	20004	288	
00458	XXT	19900	00008	00040	00454	20004	653	
00458	XXT	19900	00009	00040	00454	20004	507	
0045C	XM	39900	02008	00040	00458	20004	503	
0045C	XT	39900	08008	00040	00458	20004	503	
0045C	XXD	19900	00008	00040	00458	20004	653	
0045C	XXM	19900	00008	00040	00458	00024	253	
0045C	XXM	19900	00008	00040	00458	20004	204	
0045C	XXM	19900	00008	00040	00458	20004	253	
0045C	XXM	19900	00008	00040	00458	20004	255	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0045C	XXM	19900	0000A	00040	00458	20004	160	
0045C	XXM	19904	00008	00040	00458	00004	204	
0045C	XXM	19904	00008	00040	00458	20004	204	
0045C	XXT	19900	00008	00040	00458	20004	653	
0045E	D X	00606	0800C	00000	00458	20000	657	
0045E	D X	00606	0800C	00000	00458	20000	660	
0045E	D X	00E06	0800C	00000	00458	20000	651	
0045E	T X	00606	0800C	00000	00458	20000	660	
0045E	T X	00E06	0000C	00000	00458	20000	651	
00460	XT	19900	31029	00040	0F55C	1C020	210	
00460	X M X	00782	00004	00000	0045E	20000	246	
00464	D X	04780	08008	00001	00460	20000	657	
00464	D X	04780	08008	00001	00460	20000	660	
00464	T X	04780	08008	00001	00460	20000	657	
00464	T X	04780	08008	00001	00460	20000	660	
00466	X M X	00780	00004	00000	00C60	20000	248	
00466	X M X	00780	0000D	00001	00440	20000	248	
00466	X T X	00780	0000D	00001	00440	20000	215	
00468	XD	19920	0800A	00040	00484	28004	652	
00468	XM	19900	00008	00040	00466	20004	249	
00468	XM	19900	02009	00040	00C74	20000	250	
00468	XM	19920	0200A	00040	00484	20004	244	
00468	XT	19920	0800A	00040	00484	28004	652	
00468	XXD	19900	00008	00040	00464	20004	618	
00468	XXD	19900	00008	00040	00465	20005	406	
00468	XXM	19900	00008	00040	00465	20005	406	
00468	XXT	19900	00008	00040	00465	20005	406	
0046C	XM	39900	00009	00040	00470	20000	403	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0046C	XT	39900	00009	00040	00470	20000	403	
0046C	X D X	04780	00008	00000	00468	20000	213	
0046C	X D X	04780	00008	00000	00468	20000	502	
0046C	X M X	04780	00008	00000	00468	20000	213	
0046C	X M X	04780	00008	00000	00468	20000	252	
0046C	X M X	04780	00008	00000	00468	20000	254	
0046C	X M X	04780	00008	00000	00468	20000	304	
0046C	X M X	04780	00008	00000	00468	20000	502	
0046C	X T X	04780	00008	00000	00468	20000	213	
0046C	X T X	04780	00008	00000	00468	20000	502	
0046E	M X	00000	00084	00000	00444	00060	241	
00470	XD	19900	08008	00040	0047C	20004	407	
00470	XT	19900	08008	00040	0047C	20004	407	
00470	XXD	19900	00008	00040	0046C	00004	506	
00470	XXD	19900	00008	00040	0046C	20004	213	
00470	XXD	19900	00008	00040	0046C	20004	505	
00470	XXD	19900	00008	00040	0046C	20004	508	
00470	XXD	19900	00008	00040	00664	20004	505	
00470	XXM	19900	00008	00040	0046C	00004	506	
00470	XXM	19900	00008	00040	0046C	20004	212	
00470	XXM	19900	00008	00040	0046C	20004	213	
00470	XXM	19900	00008	00040	0046C	20004	505	
00470	XXM	19900	00008	00040	0046C	20004	508	
00470	XXM	19900	00008	00040	00664	20004	294	
00470	XXM	19900	00008	00040	00664	20004	505	
00470	XXM	39900	00009	00040	0046C	20004	295	
00470	XXT	19900	00008	00040	0046C	00004	506	
00470	XXT	19900	00008	00040	0046C	20004	213	
00470	XXT	19900	00008	00040	0046C	20004	505	
00470	XXT	19900	00008	00040	0046C	20004	508	
00470	XXT	19900	00008	00040	00664	20004	505	
00478	X D X	1C482	00081	00001	04F00	20040	500	
00478	X M X	1C482	00081	00001	04F00	20040	500	
00478	X T X	1C482	00081	00001	04F00	20040	500	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00482	XXD	19900	00009	00040	0047E	20004	511	
00482	XXM	19900	00009	00040	0047E	20004	204	
00482	XXM	19900	00009	00040	0047E	20004	511	
00482	XXT	19900	00009	00040	0047E	20004	511	
0048C	XXD	19900	00008	00040	00488	20004	503	
0048C	XXD	19900	00008	00040	00488	20004	511	
0048C	XXD	19900	0000A	00040	00488	20000	510	
0048C	XXD	19900	0000A	00040	00488	20004	203	
0048C	XXD	19900	0000A	00040	00488	20004	509	
0048C	XXM	19900	00008	00040	00488	20004	285	
0048C	XXM	19900	00008	00040	00488	20004	288	
0048C	XXM	19900	00008	00040	00488	20004	503	
0048C	XXM	19900	00008	00040	00488	20004	511	
0048C	XXM	19900	0000A	00040	00488	20000	510	
0048C	XXM	19900	0000A	00040	00488	20004	203	
0048C	XXM	19900	0000A	00040	00488	20004	509	
0048C	XXM	19900	0000A	00040	00488	2C024	306	
0048C	XXT	19900	00008	00040	00488	20004	503	
0048C	XXT	19900	00008	00040	00488	20004	511	
0048C	XXT	19900	0000A	00040	00488	20000	510	
0048C	XXT	19900	0000A	00040	00488	20004	203	
0048C	XXT	19900	0000A	00040	00488	20004	509	
00490	XXD	19900	00008	00040	0048C	20004	203	
00490	XXD	19900	00008	00040	0048C	20004	511	
00490	XXD	19900	00008	00040	0048C	20004	651	
00490	XXD	19900	00009	00040	0048C	20004	203	
00490	XXD	19900	00009	00040	0048C	20004	403	
00490	XXD	19900	00009	00040	0048C	20004	500	
00490	XXD	19900	00009	00040	0048C	20004	507	
00490	XXD	19900	00009	00040	0048C	20004	508	
00490	XXD	19900	00009	00040	0048C	20004	510	
00490	XXD	19900	00009	00040	0048C	20004	511	
00490	XXD	19900	00009	00040	0048C	20004	517	
00490	XXD	19900	0000B	00040	0048C	20004	513	
00490	XXM	19900	00008	00040	0048C	20004	203	
00490	XXM	19900	00008	00040	0048C	20004	292	
00490	XXM	19900	00008	00040	0048C	20004	511	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00490	XXM	19900	00008	00041	0048C	20004	203	
00490	XXM	19900	00009	00040	0048C	20004	203	
00490	XXM	19900	00009	00040	0048C	20004	204	
00490	XXM	19900	00009	00040	0048C	20004	248	
00490	XXM	19900	00009	00040	0048C	20004	403	
00490	XXM	19900	00009	00040	0048C	20004	500	
00490	XXM	19900	00009	00040	0048C	20004	507	
00490	XXM	19900	00009	00040	0048C	20004	508	
00490	XXM	19900	00009	00040	0048C	20004	510	
00490	XXM	19900	00009	00040	0048C	20004	511	
00490	XXM	19900	00009	00040	0048C	20004	517	
00490	XXM	19900	0000B	00040	0048C	20004	513	
00490	XXM	19980	00008	00040	0048C	20004	204	
00490	XXT	19900	00008	00040	0048C	20004	203	
00490	XXT	19900	00008	00040	0048C	20004	511	
00490	XXT	19900	00008	00040	0048C	20004	651	
00490	XXT	19900	00009	00040	0048C	20004	203	
00490	XXT	19900	00009	00040	0048C	20004	403	
00490	XXT	19900	00009	00040	0048C	20004	500	
00490	XXT	19900	00009	00040	0048C	20004	507	
00490	XXT	19900	00009	00040	0048C	20004	508	
00490	XXT	19900	00009	00040	0048C	20004	510	
00490	XXT	19900	00009	00040	0048C	20004	511	
00490	XXT	19900	00009	00040	0048C	20004	517	
00490	XXT	19900	0000B	00040	0048C	20004	513	
00490	XXT	39900	00009	00040	0048C	20004	507	
00494	XXM	19900	00008	00040	00490	20004	286	
00494	XXM	19910	0000A	00040	00490	20004	204	
00494	XXM	19940	0000B	00040	00490	20004	204	
004A2	XXD	19900	0000A	00040	0049E	20004	511	
004A2	XXM	19900	0000A	00040	0049E	20004	511	
004A2	XXT	19900	0000A	00040	0049E	20004	511	
004A3	XXD	19900	00009	00040	0049F	20004	404	
004A3	XXM	19900	00009	00040	0049F	20004	290	
004A3	XXM	19900	00009	00040	0049F	20004	404	
004A3	XXT	19900	00009	00040	0049F	20004	404	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
004A6	XXD	19900	00008	00040	004A2	20004	213	
004A6	XXD	19900	00008	00040	004A2	20004	403	
004A6	XXD	19900	00008	00040	004A2	20004	511	
004A6	XXD	19900	00008	00040	004A2	20004	650	
004A6	XXD	19900	00009	00040	004A2	20004	505	
004A6	XXD	19900	00009	00040	004A2	20004	510	
004A6	XXD	19900	0000A	00040	004A2	20004	511	
004A6	XXM	19900	00008	00040	004A2	20004	213	
004A6	XXM	19900	00008	00040	004A2	20004	250	
004A6	XXM	19900	00008	00040	004A2	20004	403	
004A6	XXM	19900	00008	00040	004A2	20004	511	
004A6	XXM	19900	00009	00040	004A2	20004	204	
004A6	XXM	19900	00009	00040	004A2	20004	505	
004A6	XXM	19900	00009	00040	004A2	20004	510	
004A6	XXM	19900	0000A	00040	004A2	20004	511	
004A6	XXT	19900	00008	00040	004A2	20004	213	
004A6	XXT	19900	00008	00040	004A2	20004	403	
004A6	XXT	19900	00008	00040	004A2	20004	511	
004A6	XXT	19900	00009	00040	004A2	20004	505	
004A6	XXT	19900	00009	00040	004A2	20004	510	
004A6	XXT	19900	0000A	00040	004A2	20004	511	
004B0	XXD	19900	00008	00040	008AC	20004	509	
004B0	XXD	19900	0000B	00040	004AC	20004	511	
004B0	XXM	19900	00008	00040	004AC	20004	243	
004B0	XXM	19900	00008	00040	008AC	20004	509	
004B0	XXM	19900	0000B	00040	004AC	20004	511	
004B0	XXM	19900	18009	00040	004AC	00024	650	
004B0	XXM	19900	18009	00040	004AC	00024	651	X
004B0	XXT	19900	00008	00040	004AC	20004	215	
004B0	XXT	19900	00008	00040	008AC	20004	509	
004B0	XXT	19900	0000A	00040	004AC	20004	403	
004B0	XXT	19900	00008	00040	004AC	20004	511	
004B1	XXT	19900	00009	00040	004AE	20004	404	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
004B2	X	D	X	01245	00004	00000	14E80	20000 502
004B2	X	D	X	01245	00004	00000	14E80	20000 503
004B2	X	M	X	01245	00004	00000	14E80	20000 502
004B2	X	M	X	01245	00004	00000	14E80	20000 503
004B2	X	T	X	01245	00004	00000	14E80	20000 502
004B2	X	T	X	01245	00004	00000	14E80	20000 503
004C8	XXD			19000	00009	00040	004C4	20004 510
004C8	XXD			19900	00009	00040	004C4	00000 506
004C8	XXD			19900	00009	00040	004C4	20000 510
004C8	XXD			19900	00009	00040	004C4	20004 505
004C8	XXD			19900	00009	00040	004C4	20004 508
004C8	XXD			19900	00009	00040	004C4	20004 510
004C8	XXD			19900	00009	00041	004C4	20000 502
004C8	XXD			19900	00009	00041	004C4	20000 506
004C8	XXD			19900	00009	00041	004C4	20000 510
004C8	XXD			19900	0000A	00040	004C4	20000 518
004C8	XXD			19900	0000A	00040	004C4	20004 508
004C8	XXD			19900	0000A	00040	004C4	20004 512
004C8	XXD			19900	0000B	00040	004C4	20004 203
004C8	XXM			19000	00009	00040	004C4	20004 510
004C8	XXM			19900	00009	00040	004C4	00000 506
004C8	XXM			19900	00009	00040	004C4	20000 510
004C8	XXM			19900	00009	00040	004C4	20004 286
004C8	XXM			19900	00009	00040	004C4	20004 505
004C8	XXM			19900	00009	00040	004C4	20004 508
004C8	XXM			19900	00009	00040	004C4	20004 510
004C8	XXM			19900	00009	00041	004C4	20000 502
004C8	XXM			19900	00009	00041	004C4	20000 506
004C8	XXM			19900	00009	00041	004C4	20000 510
004C8	XXM			19900	0000A	00040	004C4	20004 505
004C8	XXM			19900	0000A	00040	004C4	20000 518
004C8	XXM			19900	0000A	00040	004C4	20004 289
004C8	XXM			19900	0000A	00040	004C4	20004 508
004C8	XXM			19900	0000A	00040	004C4	20004 512

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
004C8	XXM	19900	0000B	00040	004C4	20004	203	
004C8	XXM	19904	00009	00040	004C4	20004	292	
004C8	XXT	19000	00009	00040	004C4	20004	510	
004C8	XXT	19900	00009	00040	004C4	00000	506	
004C8	XXT	19900	00009	00040	004C4	20000	510	
004C8	XXT	19900	00009	00040	004C4	20004	213	
004C8	XXT	19900	00009	00040	004C4	20004	505	
004C8	XXT	19900	00009	00040	004C4	20004	508	
004C8	XXT	19900	00009	00040	004C4	20004	510	
004C8	XXT	19900	00009	00041	004C4	20000	502	
004C8	XXT	19900	00009	00041	004C4	20000	506	
004C8	XXT	19900	00009	00041	004C4	20000	510	
004C8	XXT	19900	0000A	00040	004C4	20000	518	
004C8	XXT	19900	0000A	00040	004C4	20004	404	
004C8	XXT	19900	0000A	00040	004C4	20004	505	
004C8	XXT	19900	0000A	00040	004C4	20004	508	
004C8	XXT	19900	0000A	00040	004C4	20004	512	
004C8	XXT	19900	0000B	00040	004C4	20004	203	
004CB	XXD	19900	0000A	00040	004C4	20004	505	
004CC	XXD	19900	0000B	00040	004C8	20004	203	
004CC	XXD	19900	0000B	00040	004C8	20004	503	
004CC	XXD	19900	0000B	00040	004C8	20004	509	
004CC	XXD	19900	0000B	00040	004C8	20004	513	
004CC	XXM	19900	0000B	00040	004C8	20004	289	
004CC	XXM	19900	0000B	00040	004C8	20004	203	
004CC	XXM	19900	0000B	00040	004C8	20004	503	
004CC	XXM	19900	0000B	00040	004C8	20004	509	
004CC	XXM	19900	0000B	00040	004C8	20004	513	
004CC	XXM	1990C	0000B	00040	004D8	20000	285	
004CC	XXT	19900	0000B	00040	004C8	20004	203	
004CC	XXT	19900	0000B	00040	004C8	20004	503	
004CC	XXT	19900	0000B	00040	004C8	20004	509	
004CC	XXT	19900	0000B	00040	004C8	20004	513	
004D0	XXD	19900	00000	00040	004CC	20004	419	
004D0	XXD	19900	0000B	00040	004CC	20004	511	
004D0	XXD	19900	0000B	00040	004CC	20004	512	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
004D0	XXD	19900	00008	00040	004CC	20004	513	
004D0	XXD	19900	00008	00040	004CC	20004	517	
004D0	XXD	19900	00008	00040	004CC	20004	609	
004D0	XXD	19900	00008	00040	004CC	20004	653	
004D0	XXM	19900	00000	00040	004CC	20004	419	
004D0	XXM	19900	00008	00040	004CC	20004	204	
004D0	XXM	19900	00008	00040	004CC	20004	246	
004D0	XXM	19900	00008	00040	004CC	20004	253	
004D0	XXM	19900	00008	00040	004CC	20004	255	
004D0	XXM	19900	00008	00040	004CC	20004	511	
004D0	XXM	19900	00008	00040	004CC	20004	512	
004D0	XXM	19900	00008	00040	004CC	20004	513	
004D0	XXM	19900	00008	00040	004CC	20004	517	
004D0	XXM	19900	00008	00041	004CC	20004	255	
004D0	XXT	19900	00000	00040	004CC	20004	419	
004D0	XXT	19900	00008	00040	004CC	20004	511	
004D0	XXT	19900	00008	00040	004CC	20004	512	
004D0	XXT	19900	00008	00040	004CC	20004	513	
004D0	XXT	19900	00008	00040	004CC	20004	517	
004D0	XXT	19900	00008	00040	004CC	20004	609	
004D0	XXT	19900	00008	00040	004CC	20004	653	
004D4	XXM	19900	00008	00040	004D0	20004	204	
004E2	XXD	19000	00008	00040	004DE	20004	507	
004E2	XXD	19900	00008	00040	004DE	20004	507	
004E2	XXD	19900	00008	00040	004DE	20004	508	
004E2	XXD	19900	00008	00040	004DE	20004	516	
004E2	XXM	19000	00008	00040	004DE	20004	507	
004E2	XXM	19900	00008	00040	004DE	20004	288	
004E2	XXM	19900	00008	00040	004DE	20004	507	
004E2	XXM	19900	00008	00040	004DE	20004	508	
004E2	XXM	19900	00008	00040	004DE	20004	516	
004E2	XXM	19900	00008	00040	004DE	20004	518	
004E2	XXM	19900	00008	00040	004DE	20004	601	
004E2	XXT	19900	00008	00040	004DE	20004	507	
004E2	XXT	19900	00008	00040	004DE	20004	508	
004E2	XXT	19900	00008	00040	004DE	20004	516	
004E2	XXT	19900	00008	00040	004DE	20004	518	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
004E6	XXD	19900	0000A	00040	004E2	20004	601	
004E6	XXT	19900	0000A	00040	004E2	20004	601	
004F0	XXD	19900	00009	00040	004EC	20004	508	
004F0	XXD	19900	00009	00040	004EC	20004	517	
004F0	XXD	19900	00009	00042	004EC	20004	517	
004F0	XXD	19900	0000A	00040	004EC	20000	419	
004F0	XXD	19900	0000A	00040	004EC	20004	508	
004F0	XXD	19900	0000A	00040	004EC	20004	517	
004F0	XXM	19900	00009	00040	004EC	20004	204	
004F0	XXM	19900	00009	00040	004EC	20004	291	
004F0	XXM	19900	00009	00040	004EC	20004	508	
004F0	XXM	19900	00009	00040	004EC	20004	517	
004F0	XXM	19900	00009	00042	004EC	20004	517	
004F0	XXM	19900	0000A	00040	004EC	20000	419	
004F0	XXM	19900	0000A	00040	004EC	20004	255	
004F0	XXM	19900	0000A	00040	004EC	20004	306	
004F0	XXM	19900	0000A	00040	004EC	20004	314	
004F0	XXM	19900	0000A	00040	004EC	20004	508	
004F0	XXM	19900	0000A	00040	004EC	20004	517	
004F0	XXM	19990	00008	00040	004EC	20004	287	
004F0	XXT	19900	00008	00040	004EC	20004	404	
004F0	XXT	19900	00009	00040	004EC	20004	508	
004F0	XXT	19900	00009	00040	004EC	20004	517	
004F0	XXT	19900	00009	00042	004EC	20004	517	
004F0	XXT	19900	0000A	00040	004EC	20000	419	
004F0	XXT	19900	0000A	00040	004EC	20004	508	
004F0	XXT	19900	0000A	00040	004EC	20004	517	
004F0	XXT	19990	00008	00040	004EC	20004	403	
004FA	XXD	19900	00008	00040	004F6	20004	513	
004FA	XXD	19900	0000B	00040	004F6	20004	513	
004FA	XXM	19900	00008	00040	004F6	20004	240	
004FA	XXM	19900	00008	00040	004F6	20004	255	
004FA	XXM	19900	00008	00040	004F6	20004	513	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
004FA	XXM	19900	0000B	00040	004F6	20004	513	
004FA	XXT	19900	00008	00040	004F6	20004	513	
004FA	XXT	19900	00009	00040	004F6	20004	505	
004FA	XXT	19900	0000B	00040	004F6	20004	513	
004FB	XXM	19900	00008	00040	004F6	39004	290	
00504	XXD	19900	00008	00040	00500	20004	505	
00504	XXD	19900	00008	00040	00500	20004	506	
00504	XXD	19900	00008	00040	00500	20004	507	
00504	XXD	19900	00008	00040	00500	20004	510	
00504	XXD	19900	00008	00042	00500	20004	504	
00504	XXM	19900	00008	00040	00500	20004	161	
00504	XXM	19900	00008	00040	00500	20004	505	
00504	XXM	19900	00008	00040	00500	20004	506	
00504	XXM	19900	00008	00040	00500	20004	507	
00504	XXM	19900	00008	00040	00500	20004	510	
00504	XXM	19900	00008	00042	00500	20004	504	
00504	XXM	19900	0200B	00040	00500	20004	251	
00504	XXT	19900	00008	00040	00500	20004	505	
00504	XXT	19900	00008	00040	00500	20004	506	
00504	XXT	19900	00008	00040	00500	20004	507	
00504	XXT	19900	00008	00040	00500	20004	510	
00504	XXT	19900	00008	00042	00500	20004	504	
00510	XXD	19900	00008	00041	00000	20000	509	
00510	XXD	19900	00009	00041	00000	20000	513	
00510	XXD	19900	00009	00041	10000	20000	512	
00510	XXD	19900	00009	00041	10000	20000	518	
00510	XXD	19900	00009	00041	10001	20000	508	
00510	XXD	19900	00009	00041	10001	20000	517	
00510	XXD	19900	00009	00041	1FFFF	20000	406	
00510	XXD	19900	00009	00041	1FFFF	20000	500	
00510	XXD	19900	00009	00041	1FFFF	20000	512	
00510	XXD	19900	00009	00041	1FFFF	20000	517	
00510	XXD	19900	00009	00041	1FFFF	20000	518	
00510	XXD	19900	0000A	00041	00001	20000	508	
00510	XXD	19900	0000A	00041	10000	20000	508	

D1	LSURL	B1	C1	C3	D2	D3	FIG LOAD
00510	XXD	19900	0000A	00041	10000	20000	517
00510	XXD	19900	0800B	00041	00000	20000	502
00510	XXM	19900	00008	00041	00000	20000	509
00510	XXM	19900	00009	00041	00000	20000	513
00510	XXM	19900	00009	00041	0FFF1	20000	290
00510	XXM	19900	00009	00041	10000	20000	250
00510	XXM	19900	00009	00041	10000	20000	254
00510	XXM	19900	00009	00041	10000	20000	512
00510	XXM	19900	00009	00041	10000	20000	518
00510	XXM	19900	00009	00041	10001	20000	508
00510	XXM	19900	00009	00041	10001	20000	517
00510	XXM	19900	00009	00041	1F000	20000	251
00510	XXM	19900	00009	00041	1F000	20000	254
00510	XXM	19900	00009	00041	1FF10	20000	290
00510	XXM	19900	00009	00041	1FF80	20000	248
00510	XXM	19900	00009	00041	1FFC0	20000	248
00510	XXM	19900	00009	00041	1FFE0	20000	248
00510	XXM	19900	00009	00041	1FFF0	20000	248
00510	XXM	19900	00009	00041	1FFF0	20000	253
00510	XXM	19900	00009	00041	1FFFF	20000	249
00510	XXM	19900	00009	00041	1FFFF	20000	313
00510	XXM	19900	00009	00041	1FFFF	20000	406
00510	XXM	19900	00009	00041	1FFFF	20000	500
00510	XXM	19900	00009	00041	1FFFF	20000	512
00510	XXM	19900	00009	00041	1FFFF	20000	517
00510	XXM	19900	00009	00041	1FFFF	20000	518
00510	XXM	19900	00009	00041	20000	20000	305
00510	XXM	19900	0000A	00041	00001	20000	508
00510	XXM	19900	0000A	00041	00F00	20000	254
00510	XXM	19900	0000A	00041	10000	20000	253
00510	XXM	19900	0000A	00041	10000	20000	508
00510	XXM	19900	0000A	00041	10000	20000	517
00510	XXM	19900	0000A	00041	10100	20000	290
00510	XXM	19900	0000B	00041	1F000	20000	254

D1	LSURL	H1	C1	C3	D2	D3	FIG	LOAD
00510	XXM	19900	0800B	00041	00000	20000	502	
00510	XXT	19900	00008	00041	00000	20000	509	
00510	XXT	19900	00009	00041	00000	20000	513	
00510	XXT	19900	00009	00041	10000	20000	512	
00510	XXT	19900	00009	00041	10000	20000	518	
00510	XXT	19900	00009	00041	10001	20000	508	
00510	XXT	19900	00009	00041	10001	20000	517	
00510	XXT	19900	00009	00041	1FFFF	20000	406	
00510	XXT	19900	00009	00041	1FFFF	20000	500	
00510	XXT	19900	00009	00041	1FFFF	20000	512	
00510	XXT	19900	00009	00041	1FFFF	20000	517	
00510	XXT	19900	00009	00041	1FFFF	20000	518	
00510	XXT	19900	0000A	00041	00001	20000	508	
00510	XXT	19900	0000A	00041	10000	20000	508	
00510	XXT	19900	0000A	00041	10000	20000	517	
00510	XXT	19900	0800B	00041	00000	20000	502	
0051C	XXD	19900	00008	00041	00000	20000	506	
0051C	XXD	19900	00008	00041	00000	20000	510	
0051C	XXD	19900	00009	00041	10000	20000	508	
0051C	XXD	19900	00009	00041	10000	20000	510	
0051C	XXD	19900	00009	00041	10000	20000	517	
0051C	XXD	19900	00009	00041	1FC00	20000	509	
0051C	XXD	19900	00009	00041	CYCLE	20000	517	
0051C	XXD	19900	0000A	00041	00080	20000	403	
0051C	XXD	19900	3F879	00041	1FC00	20000	509	
0051C	XXM	19900	00008	00041	00000	20000	506	
0051C	XXM	19900	00008	00041	00000	20000	510	
0051C	XXM	19900	00009	00041	10000	20000	508	
0051C	XXM	19900	00009	00041	10000	20000	510	
0051C	XXM	19900	00009	00041	10000	20000	517	
0051C	XXM	19900	00009	00041	1FC00	20000	509	
0051C	XXM	19900	00009	00041	CYCLE	20000	517	
0051C	XXM	19900	0000A	00040	00010	20000	248	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0051C	XXM	19900	0000A	00040	00020	20000	244	
0051C	XXM	19900	0000A	00040	00020	20000	248	
0051C	XXM	19900	0000A	00040	00040	20000	248	
0051C	XXM	19900	0000A	00041	00002	20000	249	
0051C	XXM	19900	0000A	00041	00004	20000	249	
0051C	XXM	19900	0000A	00041	00008	20000	249	
0051C	XXM	19900	0000A	00041	00080	20000	248	
0051C	XXM	19900	0000A	00041	00080	20000	403	
0051C	XXM	19900	0000A	00041	000C0	20000	289	
0051C	XXM	19900	0000A	00041	10001	20000	249	
0051C	XXM	19900	3F879	00041	1FC00	20000	509	
0051C	XXT	19900	00008	00041	00000	20000	506	
0051C	XXT	19900	00008	00041	00000	20000	510	
0051C	XXT	19900	00009	00041	10000	20000	508	
0051C	XXT	19900	00009	00041	10000	20000	510	
0051C	XXT	19900	00009	00041	10000	20000	517	
0051C	XXT	19900	00009	00041	1FC00	20000	509	
0051C	XXT	19900	00009	00041	CYCLE	20000	517	
0051C	XXT	19900	0000A	00041	00080	20000	403	
0051C	XXT	19900	3F879	00041	1FC00	20000	509	
00526	XXD	19900	00008	00040	00522	20004	203	
00526	XXD	19900	00008	00040	00522	20004	210	
00526	XXD	19900	00008	00040	00522	20004	511	
00526	XXD	19900	0000A	00040	00522	20004	512	
00526	XXD	19900	0000A	00040	00522	20004	513	
00526	XXD	19900	0000A	00040	00522	20004	517	
00526	XXD	19900	26008	00040	00522	20004	504	
00526	XXM	19900	00008	00040	00522	20004	203	
00526	XXM	19900	00008	00040	00522	20004	210	
00526	XXM	19900	00008	00040	00522	20004	511	
00526	XXM	19900	0000A	00040	00522	20004	512	
00526	XXM	19900	0000A	00040	00522	20004	513	
00526	XXM	19900	0000A	00040	00522	20004	517	

D1	LSURL	B1	C1	C3	D2	D3	FIG LOAD
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00526	XXM	19900	26008	00040	00522	20004	504
00526	XXT	19900	00008	00040	00522	20004	203
00526	XXT	19900	00008	00040	00522	20004	210
00526	XXT	19900	00008	00040	00522	20004	511
00526	XXT	19900	0000A	00040	00522	20004	512
00526	XXT	19900	0000A	00040	00522	20004	513
00526	XXT	19900	0000A	00040	00522	20004	517
00526	XXT	19900	26008	00040	00522	20004	504
00530	XXD	19900	00008	00040	0052C	20004	419
00530	XXD	19900	00008	00041	0052C	20004	513
00530	XXD	19900	00009	00040	0052C	20004	510
00530	XXD	19900	00009	00040	0052C	20004	512
00530	XXD	19900	00009	00040	0052C	20004	513
00530	XXM	19900	00008	00040	0052C	20004	159
00530	XXM	19900	00008	00040	0052C	20004	163
00530	XXM	19900	00008	00040	0052C	20004	242
00530	XXM	19900	00008	00040	0052C	20004	253
00530	XXM	19900	00008	00040	0052C	20004	419
00530	XXM	19900	00008	00041	0052C	20004	513
00530	XXM	19900	00009	00040	0052C	20004	510
00530	XXM	19900	00009	00040	0052C	20004	512
00530	XXM	19900	00009	00040	0052C	20004	513
00530	XXT	19900	00008	00040	0052C	20004	419
00530	XXT	19900	00008	00041	0052C	20004	513
00530	XXT	19900	00009	00040	0052C	20004	510
00530	XXT	19900	00009	00040	0052C	20004	512
00530	XXT	19900	00009	00040	0052C	20004	513
0053C	XXD	19900	00009	00040	00538	20004	508
0053C	XXD	19900	00009	00040	00538	20004	517
0053C	XXD	19900	00009	00041	00538	20000	509
0053C	XXM	19900	00009	00040	00538	20004	508
0053C	XXM	19900	00009	00040	00538	20004	517
0053C	XXM	19900	00009	00041	00538	20000	509
0053C	XXT	19900	00009	00040	00538	20004	508
0053C	XXT	19900	00009	00040	00538	20004	517

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0053C	XXT	19900	00009	00041	00538	20000	509	
00548	XXD	19900	00008	00040	00544	00004	506	
00548	XXD	19900	00008	00040	00544	20004	203	
00548	XXD	19900	00008	00040	00544	20004	505	
00548	XXD	19900	00008	00040	00544	20004	510	
00548	XXD	19900	00008	00040	00544	20004	511	
00548	XXM	19900	00008	00040	00544	00004	506	
00548	XXM	19900	00008	00040	00544	20004	203	
00548	XXM	19900	00008	00040	00544	20004	247	
00548	XXM	19900	00008	00040	00544	20004	289	
00548	XXM	19900	00008	00040	00544	20004	504	
00548	XXM	19900	00008	00040	00544	20004	505	
00548	XXM	19900	00008	00040	00544	20004	510	
00548	XXM	19900	00008	00040	00544	20004	511	
00548	XXM	19900	0000A	00040	00544	20004	285	
00548	XXT	19900	00008	00040	00544	00004	506	
00548	XXT	19900	00008	00040	00544	20004	203	
00548	XXT	19900	00008	00040	00544	20004	505	
00548	XXT	19900	00008	00040	00544	20004	510	
00548	XXT	19900	00008	00040	00544	20004	511	
00554	XXD	19900	00009	00040	00550	20004	505	
00554	XXD	19900	00009	00040	00550	20004	510	
00554	XXM	19900	00009	00040	00550	20004	505	
00554	XXM	19900	00009	00040	00550	20004	510	
00554	XXT	19900	00008	00040	00550	20004	404	
00554	XXT	19900	00009	00040	00550	20004	504	
00554	XXT	19900	00009	00040	00550	20004	505	
00554	XXT	19900	00009	00040	00550	20004	510	
00562	XXD	19900	00009	00041	0055E	20000	505	
00562	XXD	19900	0000A	00040	0055E	20004	210	
00562	XXD	19900	0000A	00040	0055E	20004	511	
00562	XXD	19900	0000A	00040	0055E	20004	516	
00562	XXD	19900	0000A	00040	0055E	20004	653	
00562	XXD	19900	0000A	00040	0055E	20040	203	
00562	XXM	19900	00009	00040	0055E	20004	253	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00562	XXM	19900	00009	00041	0055E	20000	505	
00562	XXM	19900	0000A	00040	0055E	20004	210	
00562	XXM	19900	0000A	00040	0055E	20004	511	
00562	XXM	19900	0000A	00040	0055E	20004	516	
00562	XXM	19900	0000A	00040	0055E	20040	203	
00562	XXT	19900	00009	00041	0055E	20000	505	
00562	XXT	19900	0000A	00040	0055E	20004	210	
00562	XXT	19900	0000A	00040	0055E	20004	511	
00562	XXT	19900	0000A	00040	0055E	20004	516	
00562	XXT	19900	0000A	00040	0055E	20004	653	
00562	XXT	19900	0000A	00040	0055E	20040	203	
00563	XXD	19900	0000A	00040	0055E	20004	500	
00563	XXD	19900	0000A	00040	0055E	20004	512	
00563	XXM	19900	0000A	00040	0055E	20004	500	
00563	XXM	19900	0000A	00040	0055E	20004	512	
00563	XXT	19900	0000A	00040	0055E	20004	500	
00563	XXT	19900	0000A	00040	0055E	20004	512	
00580	X M X	3C5FD	00808	00001	00000	20000	209	
00580	X T X	3CDFD	00808	00001	00000	20000	209	
0059C	X D X	19900	00008	00040	00130	20000	602	X
0059C	X T X	19900	00008	00041	001E1	20000	601	X
005BA	XXT	19900	1000A	00040	005B6	20004	509	
005D8	XXD	19900	00009	00040	005D4	20004	609	
005D8	XXM	19900	00009	00040	00AD4	20004	250	
005D8	XXT	19900	00009	00040	005D4	20004	609	
005E4	XXD	19900	00008	00040	00192	20004	406	
005E4	XXM	19900	00008	00040	00192	20004	406	
005E4	XXT	19900	00008	00040	00192	20004	406	
005EC	XXD						510	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
005EC	XXD	19900	00008	00040	005E8	20004	203	
005EC	XXD	19900	00008	00040	005E8	20004	505	
005EC	XXD	19900	00008	00040	005E8	20004	508	
005EC	XXD	19900	00008	00040	005E8	20004	517	
005EC	XXD	19900	00808	00040	005E8	20004	516	
005EC	XXM						510	
005EC	XXM	19900	00008	00040	005E8	14024	312	
005EC	XXM	19900	00008	00040	005E8	20004	203	
005EC	XXM	19900	00008	00040	005E8	20004	247	
005EC	XXM	19900	00008	00040	005E8	20004	289	
005EC	XXM	19900	00008	00040	005E8	20004	505	
005EC	XXM	19900	00008	00040	005E8	20004	508	
005EC	XXM	19900	00008	00040	005E8	20004	509	
005EC	XXM	19900	00008	00040	005E8	20004	517	
005EC	XXM	19900	00808	00040	005E8	20004	516	
005EC	XXT						510	
005EC	XXT	19900	00008	00040	005E8	20004	203	
005EC	XXT	19900	00008	00040	005E8	20004	505	
005EC	XXT	19900	00008	00040	005E8	20004	508	
005EC	XXT	19900	00008	00040	005E8	20004	517	
005EC	XXT	19900	00808	00040	005E8	20004	516	
005FE	X D X	05FC0	0000C	00001	04FC8	20000	210	
005FE	X M X	05FC0	0000C	00001	04FC8	20000	210	
005FE	X M X	05FC0	0000C	00001	04FC8	20000	225	
005FE	X T X	05FC0	0000C	00001	04FC8	20000	210	
00600	XXD	19900	00008	00040	007FE	00004	402	
00600	XXD	19900	0000A	00040	005FC	20004	506	
00600	XXD	19900	0000A	00040	005FC	20004	510	
00600	XXM	19900	00008	00040	007FE	00004	402	
00600	XXM	19900	00009	00040	005FC	00400	250	
00600	XXM	19900	00009	00040	005FC	20004	250	
00600	XXM	19900	00009	00040	005FC	20004	251	
00600	XXM	19900	00009	00040	005FC	20004	252	
00600	XXM	19900	00009	00040	005FC	20004	253	
00600	XXM	19900	00009	00040	005FC	20004	254	
00600	XXM	19900	00009	00040	005FC	20004	313	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00600	XXM	19900	0000A	00040	005FC	20004	506	
00600	XXM	19900	0000A	00040	005FC	20004	510	
00600	XXT	19900	00008	00040	007FE	00004	402	
00600	XXT	19900	0000A	00040	005FC	20004	506	
00600	XXT	19900	0000A	00040	005FC	20004	510	
0063C	XXM	19900	0000A	00040	00638	20004	247	
0063C	XXM	19900	0000A	00040	00638	20004	251	
0063C	XXM	19900	0000A	00040	00638	20004	254	
0063C	XXM	19900	0000A	00040	00638	20004	312	
00678	XXM	19900	0000A	00040	00674	20004	250	
00678	XXM	19900	0000A	00040	00674	20004	254	
006B4	XXM	19900	00009	00040	006B0	20004	309	
006B4	XXM	19900	0000A	00040	006B0	20004	216	
006B8	XXM	19900	0000A	00040	006D8	20004	240	
006DC	XXM	19900	00009	00040	006D8	20004	250	
006DC	XXM	19900	00009	00040	006D8	20004	253	
006E2	XXT	19000	00008	00040	004DE	20004	507	
00704	XXM	19900	00009	00040	00700	20004	323	
0072C	XXM	19900	00009	00040	00728	20004	250	
0072C	XXM	19900	00009	00040	00728	20004	252	
0072C	XXM	19900	00009	00040	00728	20004	253	
00740	XXM	19900	00009	00040	0073C	20004	250	
00752	XXD	19900	0C00A	00040	0074E	20004	210	
00752	XXM	19900	0C00A	00040	0074E	20004	210	
00752	XXT	19900	0C00A	00040	0074E	20004	210	
0077A	XXM	19900	0000A	00040	00706	20004	286	
0078E	XXM	19900	0000A	00040	0078A	39824	310	
007CA	XXM	19900	0000A	00040	007C6	20004	310	
007DE	XXM	19900	00009	00040	007DA	20004	301	
00854	XXD	19900	00009	00040	00850	20004	203	
00854	XXD	19900	00009	00040	00850	20004	516	
00854	XXD	19900	0E00A	00040	00850	20004	507	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00854	XXD	19900	0E00A	00040	00850	20004	510	
00854	XXM	19900	00009	00040	00850	20004	203	
00854	XXM	19900	00009	00040	00850	20004	516	
00854	XXM	19900	0000A	00040	00850	20004	312	
00854	XXM	19900	0E00A	00040	00850	20004	507	
00854	XXM	19900	0E00A	00040	00850	20004	510	
00854	XXT	19900	00009	00040	00850	20004	203	
00854	XXT	19900	00009	00040	00850	20004	516	
00854	XXT	19900	0E00A	00040	00850	20004	507	
00854	XXT	19900	0E00A	00040	00850	20004	510	
00864	XXD	19900	00008	00040	00860	00024	650	
00864	XXD	19900	00008	00040	00860	00024	654	
00872	XXD	19900	00008	00040	0086E	20004	513	
00872	XXD	19900	0000B	00040	0086E	20004	419	
00872	XXM	19900	00008	00040	0086E	20004	513	
00872	XXM	19900	0000B	00040	0086E	20004	419	
00872	XXT	19900	00008	00040	0086E	20004	513	
00872	XXT	19900	0000B	00040	0086E	20004	419	
0087E	XXD	19900	0000B	00040	0087A	20004	513	
0087E	XXM	19900	00009	00040	0087A	20004	204	
0087E	XXM	19900	0000B	00040	0087A	20004	513	
0087E	XXM	19901	00009	00040	0087A	20004	204	
0087E	XXT	19900	0000B	00040	0087A	20004	513	
0088C	XXM	19900	00008	00040	00888	20004	204	
0088C	XXM	19902	00008	00040	00888	20004	204	
008A8	XXM	19900	00009	00040	008A4	20004	212	
008B0	XXD	19900	00008	00040	008AC	20004	203	
008B0	XXD	19900	00008	00040	008AC	20004	505	
008B0	XXD	19900	00008	00040	008AC	20004	509	
008B0	XXD	19900	00008	00040	008AC	20004	510	
008B0	XXD	19900	00008	00040	008AC	20004	516	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
008B0	XXM	19900	00008	00040	008AC	20004	203	
008B0	XXM	19900	00008	00040	008AC	20004	505	
008B0	XXM	19900	00008	00040	008AC	20004	509	
008B0	XXM	19900	00008	00040	008AC	20004	510	
008B0	XXM	19900	00008	00040	008AC	20004	516	
008B0	XXT	19900	00008	00040	008AC	20004	203	
008B0	XXT	19900	00008	00040	008AC	20004	505	
008B0	XXT	19900	00008	00040	008AC	20004	509	
008B0	XXT	19900	00008	00040	008AC	20004	510	
008B0	XXT	19900	00008	00040	008AC	20004	516	
008BE	XXT	19900	00008	00040	0007F	20004	506	
008DC	XXD	19900	0000A	00041	0D1B0	20000	503	
008DC	XXM	19900	0000A	00040	008L8	20004	212	
008DC	XXM	19900	0000A	00041	0D1B0	20000	503	
008DC	XXT	19900	0000A	00041	0D1B0	20000	503	
008E6	XXM	19900	00008	00040	008E2	20004	309	
008F4	XXD	19900	00009	00040	008F0	20004	403	
008F4	XXD	19900	00009	00040	008F0	20004	511	
008F4	XXM	19900	00009	00040	008F0	20004	285	
008F4	XXM	19900	00009	00040	008F0	20004	403	
008F4	XXM	19900	00009	00040	008F0	20004	511	
008F4	XXT	19900	00009	00040	008F0	20004	403	
008F4	XXT	19900	00009	00040	008F0	20004	511	
00902	XXD	19900	00008	00040	008FE	20004	511	
00902	XXM	19900	00008	00040	008FE	20004	511	
00902	XXT	19900	00008	00040	008FE	20004	511	
00903	XXM	19900	00008	00040	008FF	20004	290	
0090C	XXD	19900	00009	00040	00908	20040	403	
0090C	XXD	19900	0000A	00040	00908	20004	203	
0090C	XXM	19900	00009	00040	00908	20004	289	
0090C	XXM	19900	00009	00040	00908	20040	403	
0090C	XXM	19900	0000A	00040	00908	20004	203	
0090C	XXT	19900	00009	00040	00908	20040	403	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0090C	XXT	19900	0000A	00040	00908	20004	203	
00928	XXM	19900	00009	00040	00924	20004	240	
00928	XXM	19900	00009	00040	00924	20004	241	
00928	XXM	19900	00009	00040	00924	20004	242	
00929	XXD	19900	00009	00040	00923	20004	211	
00929	XXM	19900	00009	00040	00923	20004	211	
00929	XXT	19900	00009	00040	00923	20004	211	
00948	X D X	30064	00008	00002	0099C	00000	506	
00948	X M X	30064	00008	00002	0099C	00000	506	
00948	X T X	30064	00008	00002	0099C	00000	506	
00952	XXD	19900	00009	00040	0094E	20004	403	
00952	XXD	19900	0000A	00040	0094E	20004	203	
00952	XXD	19900	0000A	00040	0094E	20004	403	
00952	XXD	19900	0000A	00040	0094E	20004	511	
00952	XXM	19900	00009	00040	0094E	20004	403	
00952	XXM	19900	0000A	00040	0094E	20004	203	
00952	XXM	19900	0000A	00040	0094E	20004	403	
00952	XXM	19900	0000A	00040	0094E	20004	511	
00952	XXT	19900	00009	00040	0094E	20004	403	
00952	XXT	19900	0000A	00040	0094E	20004	203	
00952	XXT	19900	0000A	00040	0094E	20004	403	
00952	XXT	19900	0000A	00040	0094E	20004	511	
00964	XXD	19900	00008	00040	00960	20004	507	
00964	XXM	19900	00008	00040	00960	20004	507	
00964	XXT	19900	00008	00040	00960	20004	507	
00980	XXD	19900	00009	00040	0097C	20004	203	
00980	XXD	19900	00009	00040	0097C	20004	506	
00980	XXD	19900	00009	00040	0097C	20004	510	
00980	XXD	19900	00009	00040	0097C	20004	512	
00980	XXD	19900	00009	00040	0097C	20004	516	
00980	XXD	19900	00009	00040	0097C	20004	517	
00980	XXD	19900	0000A	00040	0097C	20004	508	
00980	XXM	19900	00009	00040	0097C	20004	161	
00980	XXM	19900	00009	00040	0097C	20004	203	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00980	XXM	19900	00009	00040	0097C	20004	216	
00980	XXM	19900	00009	00040	0097C	20004	255	
00980	XXM	19900	00009	00040	0097C	20004	289	
00980	XXM	19900	00009	00040	0097C	20004	312	
00980	XXM	19900	00009	00040	0097C	20004	506	
00980	XXM	19900	00009	00040	0097C	20004	510	
00980	XXM	19900	00009	00040	0097C	20004	512	
00980	XXM	19900	00009	00040	0097C	20004	516	
00980	XXM	19900	00009	00040	0097C	20004	517	
00980	XXM	19900	00009	00040	0097C	20004	313	X
00980	XXM	19900	0000A	00040	0097C	20004	508	
00980	XXT	19900	00009	00040	0097C	20004	203	
00980	XXT	19900	00009	00040	0097C	20004	506	
00980	XXT	19900	00009	00040	0097C	20004	510	
00980	XXT	19900	00009	00040	0097C	20004	512	
00980	XXT	19900	00009	00040	0097C	20004	516	
00980	XXT	19900	00009	00040	0097C	20004	517	
00980	XXT	19900	0000A	00040	0097C	20004	508	
00994	X D X	3C990	0E0AB	00000	00150		406	
00994	X T X	3C990	0E0AB	00000	001L1		406	
009A2	XXM	19900	0000A	00040	0099E	20004	211	
00A08	XXM	19900	00009	00040	00AD4	20004	313	
00A0A	X M X	050D0	00008	00000	00E20	20000	226	
00A3C	X M X	19C00	00008	00041	003FF	20000	301	X
00A44	XXD	19900	00008	00040	00A40	20004	203	
00A44	XXD	19900	00008	00040	00A40	20004	624	
00A44	XXD	19900	00008	00040	00A40	20004	616	X
00A44	XXM	19900	00008	00040	00A00	20000	243	
00A44	XXM	19900	00008	00040	00A40	20004	203	
00A44	XXM	19900	00008	00040	00A40	20004	301	
00A44	XXM	19900	00003	00040	00A40	20004	310	
00A44	XXM	19900	00008	00040	00A40	20004	517	
00A44	XXM	19900	00009	00040	00A40	20004	240	
00A44	XXM	19900	00009	00040	00A40	20004	310	
00A44	XXM	19900	0000A	00040	00A40	20004	240	
00A44	XXT	19900	00008	00004	00B40	20004	616	
00A44	XXT	19900	00008	00040	00A40	20004	203	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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00A44	XXT	19900	00008	00040	00A40	20004	517	
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00A44	XXT	19900	00008	00040	00A40	20004	616	
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00A44	XXT	19900	00008	00040	00A40	20004	624	
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00A62	X M X	19C00	00008	00041	000C4	20000	162	X
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00A62	X M X	19C00	00008	00041	000C4	20000	305	X
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00A62	X M X	19C00	00008	00041	000C4	20000	307	X
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00A62	X M X	19C00	00008	00041	000C4	20000	309	X
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00A62	X M X	19C00	00008	00041	000C4	20000	310	X
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00A62	X M X	19C00	00008	00041	000C4	20000	322	X
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00A6A	XXM	19900	00008	00040	00A66	00024	213	
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00A6A	XXM	19900	00008	00040	00A66	20004	273	
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00A6A	XXM	19900	00008	00040	00A66	20004	293	
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00A6A	XXM	19900	00008	00040	00A66	20004	309	
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00A6A	XXM	19900	00008	00040	00A66	20004	310	
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00A6A	XXM	19900	00008	00040	00A66	20004	312	
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00A6A	XXM	19900	00008	00040	00A66	20004	313	
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00A6A	XXM	19900	00008	00040	00A66	20004	321	
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00A6A	XXM	19900	00008	00040	00A66	20004	511	
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00A6A	XXM	19900	00008	00040	00A66	20004	212	X
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00A6A	XXM	19900	00008	00040	00A66	20004	251	X
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00A6A	XXM	19900	0000B	00040	00A66	20004	294	
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00A6A	XXM	19900	0000B	00040	00A66	20004	301	
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00A6A	XXM	19900	0000B	00040	00A66	20004	307	
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00A6A	XXM	19900	0000B	00040	00A66	20004	311	
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00A6A	XXM	19900	0000B	00040	00A66	20004	312	
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00A6A	XXM	19900	0000B	00040	00A66	20004	314	
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00A6A	XXM	19900	0000B	00040	00A66	20004	503	
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00A6A	XXM	19900	0000B	00040	00A66	20004	512	
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00A6A	XXM	19900	0000B	00040	00A66	20004	513	
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00A6A	XXM	19900	0000B	00040	00A66	20004	515	
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00A7C	XXM	19900	00009	00040	00A78	20004	310	
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00A7C	XXM	19900	00009	00040	00A78	20004	312	
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00A7C	XXM	19900	00009	00040	00A78	20004	315	
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00A7C	XXM	19900	00009	00040	00A78	20004	301	XX
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00A7C	XXM	19900	00009	00040	00A78	3F804	212	
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00A7C	XXM	19900	0000A	00040	00578	20004	210	
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00A7C	XXM	19900	0000A	00040	00A78	20000	294	
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00A7C	XXM	19900	0000A	00040	00A78	20004	211	
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00A7C	XXM	19900	0000A	00040	00A78	20004	294	
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00A7C	XXM	19900	0000A	00040	00A78	20004	313	
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00A7C	XXT	19900	2600A	00040	00A78	20004	505	
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D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00A9C	X	D	X	19900	00008	00040	00130	20000 602 X
00A9C	X	D	X	19C00	00008	00040	00130	00000 604 X
00A9C	X	D	X	19C00	00008	00040	00130	20000 612
00A9C	X	D	X	19C00	00008	00040	00130	20000 604 X
00A9C	X	D	X	19C00	00008	00040	00130	20000 605 X
00A9C	X	D	X	19C00	00008	00041	00130	20000 604 X
00A9C	X	D	X	19C00	00009	00040	00130	20000 612
00A9C	X	D	X	19C00	00009	00040	00130	20000 604 X
00A9C	X	D	X	19C00	0000B	00040	00130	20000 616 X
00A9C	X	D	X	19C00	0000B	00040	00130	20000 624 X
00A9C	X	T	X	19C00	00008	00041	001E1	20000 612
00A9C	X	T	X	19C00	00008	00041	001E1	20000 604 X
00A9C	X	T	X	19C00	00009	00041	001E1	20000 612
00A9C	X	T	X	19C00	00009	00041	001E1	20000 604 X
00A9C	X	T	X	19C00	0000B	00041	001E1	20000 616 X
00A9C	X	T	X	19C00	0000B	00041	001E1	20000 624 X
00AA4	XXD			19900	00008	00040	00AA0 0D024	653 X
00AA4	XXD			19900	00008	00040	00AA0 20004	609
00AA4	XXD			19900	00008	00040	00AA0 20004	610
00AA4	XXD			19900	00008	00040	00AA0 20004	612
00AA4	XXD			19900	00008	00040	00AA0 20004	614
00AA4	XXD			19900	00008	00040	00AA0 20004	617
00AA4	XXD			19900	00008	00040	00AA0 20004	618
00AA4	XXD			19900	00008	00040	00AA0 20004	620
00AA4	XXD			19900	00008	00040	00AA0 20004	650
00AA4	XXD			19900	00008	00040	00AA0 20004	651
00AA4	XXD			19900	00008	00040	00AA0 20004	652
00AA4	XXD			19900	00008	00040	00AA0 20004	653
00AA4	XXD			19900	00008	00040	00AA0 20004	658
00AA4	XXD			19900	00008	00040	00AA0 20004	614 X
00AA4	XXD			19900	00008	00040	00AA0 20004	623 X
00AA4	XXD			19900	00008	00040	00AA0 20004	650 X
00AA4	XXD			19900	00008	00040	00AA0 20004	652 X
00AA4	XXD			19900	00008	00080	00AA0 20004	650
00AA4	XXD			19900	00009	00040	00AA0 20004	616
00AA4	XXD			19900	0000A	00040	00AA0 20004	601

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00AA4	XXD	19900	0000A	00040	00AA0	20004	616	
00AA4	XXD	19900	0000A	00040	00AA0	20004	624	
00AA4	XXD	19900	0000B	00040	00AA0	20004	611	
00AA4	XXD	19900	0000B	00040	00AA0	20004	617	
00AA4	XXD	19900	0000B	00040	00AA0	20004	618	
00AA4	XXD	19900	0000B	00040	00AA0	20004	624	
00AA4	XXD	19900	0000B	00100	00AA0	20004	622	
00AA4	XXM	19900	00008	00040	00AA0	20004	301	X
00AA4	XXM	19900	0000A	00040	00AA0	20004	601	
00AA4	XXT	19900	00008	00040	00AA0	10004	618	
00AA4	XXT	19900	00008	00040	00AA0	10004	617	X
00AA4	XXT	19900	00008	00040	00AA0	20004	511	
00AA4	XXT	19900	00008	00040	00AA0	20004	601	
00AA4	XXT	19900	00008	00040	00AA0	20004	602	
00AA4	XXT	19900	00008	00040	00AA0	20004	609	
00AA4	XXT	19900	00008	00040	00AA0	20004	610	
00AA4	XXT	19900	00008	00040	00AA0	20004	612	
00AA4	XXT	19900	00008	00040	00AA0	20004	614	
00AA4	XXT	19900	00008	00040	00AA0	20004	617	
00AA4	XXT	19900	00008	00040	00AA0	20004	618	
00AA4	XXT	19900	00008	00040	00AA0	20004	619	
00AA4	XXT	19900	00008	00040	00AA0	20004	620	
00AA4	XXT	19900	00008	00040	00AA0	20004	621	
00AA4	XXT	19900	00008	00040	00AA0	20004	650	
00AA4	XXT	19900	00008	00040	00AA0	20004	651	
00AA4	XXT	19900	00008	00040	00AA0	20004	652	
00AA4	XXT	19900	00008	00040	00AA0	20004	653	
00AA4	XXT	19900	00008	00040	00AA0	20004	658	
00AA4	XXT	19900	00008	00040	00AA0	20004	610	X
00AA4	XXT	19900	00008	00040	00AA0	20004	614	X
00AA4	XXT	19900	00008	00040	00AA0	20004	622	X
00AA4	XXT	19900	00008	00040	00AA0	20004	623	X
00AA4	XXT	19900	00008	00040	00AA0	20004	652	X
00AA4	XXT	19900	00009	00040	00AA0	20004	616	
00AA4	XXT	19900	00009	00041	00AA0	20004	617	
00AA4	XXT	19900	0000A	00040	00AA0	20004	616	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
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00AA4	XXT	19900	0000A	00040	00AA0	20004	624	
00AA4	XXT	19900	0000B	00040	00AA0	20004	503	
00AA4	XXT	19900	0000B	00040	00AA0	20004	515	
00AA4	XXT	19900	0000B	00040	00AA0	20004	611	
00AA4	XXT	19900	0000B	00040	00AA0	20004	617	
00AA4	XXT	19900	0000B	00040	00AA0	20004	618	
00AA4	XXT	19900	0000B	00040	00AA0	20004	622	
00AA4	XXT	19900	0000B	00040	00AA0	20004	624	
00AB6	XXD	19900	00009	00040	00AB2	20004	609	
00AB6	XXD	19900	00009	00040	00AB2	20004	611	
00AB6	XXD	19900	00009	00040	00AB2	20004	615	
00AB6	XXD	19900	00009	00040	00AB2	20004	617	
00AB6	XXD	19900	00009	00040	00AB2	20004	619	
00AB6	XXD	19900	00009	00040	00AB2	20004	650	
00AB6	XXD	19900	00009	00040	00AB2	20004	651	
00AB6	XXD	19900	00009	00040	00AB2	20004	652	
00AB6	XXD	19900	00009	00040	00AB2	20004	653	
00AB6	XXD	19900	00009	00040	00AB2	20004	656	
00AB6	XXD	19900	00009	00040	00AB2	20004	657	
00AB6	XXD	19900	00009	00040	00AB2	20004	658	
00AB6	XXD	19900	00009	00040	00AB2	20004	659	
00AB6	XXD	19900	00009	00040	00AB2	20004	607	X
00AB6	XXD	19900	0000A	00040	00AB2	20004	609	
00AB6	XXM	19900	00009	00040	00AB2	20004	512	
00AB6	XXM	19900	0E00A	00040	00AB2	20004	312	X
00AB6	XXT	19900	00009	00040	00AB2	20004	605	
00AB6	XXT	19900	00009	00040	00AB2	20004	609	
00AB6	XXT	19900	00009	00040	00AB2	20004	611	
00AB6	XXT	19900	00009	00040	00AB2	20004	617	
00AB6	XXT	19900	00009	00040	00AB2	20004	652	
00AB6	XXT	19900	00009	00040	00AB2	20004	653	
00AB6	XXT	19900	00009	00040	00AB2	20004	656	
00AB6	XXT	19900	00009	00040	00AB2	20004	657	
00AB6	XXT	19900	00009	00040	00AB2	20004	658	
00AB6	XXT	19900	00009	00040	00AB2	20004	607	X

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00AB6	XXT	19900	0000A	00040	00AB2	20004	609	
00AB8	XXM	19900	00009	00040	00AD4	20004	213	
00AD4	XXD	19900	00009	00000	00AE0	20000	617	
00AD4	XXD	19900	00009	00040	00AE0	20000	610	
00AD4	XXM	19900	0000B	00040	00F04	20000	322	
00AD4	XXT	19900	00009	00040	00AE0	20000	609	
00AD4	XXT	19900	00009	00040	00AE0	20000	610	
00AD4	XXT	19900	00009	00040	00AE0	20000	617	
00AD8	XXD	19900	00009	00040	00AD4	20004	601	
00AD8	XXD	19900	00009	00040	00AD4	20004	604	
00AD8	XXD	19900	00009	00040	00AD4	20004	609	
00AD8	XXD	19900	00009	00040	00AD4	20004	610	
00AD8	XXD	19900	00009	00040	00AD4	20004	612	
00AD8	XXD	19900	00009	00040	00AD4	20004	652	
00AD8	XXD	19900	00009	00040	00AD4	20004	653	
00AD8	XXM	19900	00009	00040	00AD4	04024	312	
00AD8	XXM	19900	00009	00040	00AD4	19824	312	
00AD8	XXM	19900	00009	00040	00AD4	20004	211	
00AD8	XXM	19900	00009	00040	00AD4	20004	214	
00AD8	XXM	19900	00009	00040	00AD4	20004	249	
00AD8	XXM	19900	00009	00040	00AD4	20004	250	
00AD8	XXM	19900	00009	00040	00AD4	20004	251	
00AD8	XXM	19900	00009	00040	00AD4	20004	254	
00AD8	XXM	19900	00009	00040	00AD4	20004	310	
00AD8	XXM	19900	00009	00040	00AD4	20004	313	
00AD8	XXM	19900	00009	00040	00AD4	20004	313	X
00AD8	XXM	19900	00009	00040	00AD4	35004	213	
00AD8	XXM	19900	00009	00041	10000	20000	502	
00AD8	XXT	19900	00009	00040	00AD4	20004	502	
00AD8	XXT	19900	00009	00040	00AD4	20004	601	
00AD8	XXT	19900	00009	00040	00AD4	20004	604	
00AD8	XXT	19900	00009	00040	00AD4	20004	609	
00AD8	XXT	19900	00009	00040	00AD4	20004	610	
00AD8	XXT	19900	00009	00040	00AD4	20004	612	
00AD8	XXT	19900	00009	00040	00AD4	20004	652	
00AD8	XXT	19900	00009	00040	00AD4	20004	653	
00AD8	XXT	19900	00009	00040	00AD4	20004	661	
00AD8	XXT	19900	00009	00040	00AD4	20004	624	X

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00B9A	XXD	3B980	00008	00041	00444	26000	509	
00B9A	XXM	19998	0400A	00041	11B53	20000	247	
00B9A	XXM	3B980	00008	00041	00444	26000	509	
00B9A	XXT	3B980	00008	00041	00444	26000	509	
00C7E	XXD	19900	00009	00041	00000	20000	215	
00C7E	XXM	19900	00009	00040	00000	00024	310	
00C7E	XXM	19900	00009	00040	00000	20000	162	
00C7E	XXM	19900	00009	00040	0044C	20004	211	
00C7E	XXM	19900	00009	00040	0077F	20000	210	
00C7E	XXM	19900	00009	00041	00000	20000	215	
00C7E	XXM	19900	00009	00041	00000	20000	255	
00C7E	XXM	19900	0000A	00040	0F0F1	14024	310	
00C7E	XXT	19900	00009	00041	00000	20000	215	
00C7E	XXT	19900	00009	00041	04720	20000	215	
00C7F	XXD	19900	0000A	00040	1044B	20000	508	
00C7F	XXM	19900	0000A	00040	1044B	20000	508	
00C7F	XXT	19900	0000A	00040	1044B	20000	508	
00C90	XXD	19900	00004	00040	00000	20000	215	
00C90	XXM	19900	00004	00040	00000	20000	215	
00C90	XXM	19900	0000A	00040	00000	20000	215	
00C90	XXM	19900	0000A	00041	00F0F	20000	502	
00C90	XXM	19900	0000A	00041	10F0F	20000	309	
00C90	XXM	19900	0000A	00041	CYCLE	20000	215	
00C90	XXT	19900	0000A	00040	00000	20000	215	
00CA2	XXM	19900	00009	00041	10F0F	20000	217	
00CB4	XXD	09900	00009	00040	00000	20000	211	
00CB4	XXD	19900	00008	00040	00000	20000	211	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
00CB4	XXM	09900	00009	00040	00000	20000	211	
00CB4	XXM	19900	00008	00040	00000	20000	211	
00CB4	XXM	19900	0000A	00041	10F0F	20000	292	
00CB4	XXM	19900	0000A	00041	CYCLE	20000	216	
00CB4	XXT	09900	00009	00040	00000	20000	211	
00CB4	XXT	19900	00008	00040	00000	20000	211	
00CB4	XXT	19900	00009	00040	00000	20000	502	
00CB4	XXT	19900	00009	00040	0077F	20000	210	
00D3C	XXM	19900	0000A	00040	00D38	20004	216	
00D42	XXT	18800	0E00A	00B3E	00040	20000	604	
00D42	XXT	19900	0E00A	00040	00B3E	20000	604	X
00E03	X D X	20000	00880	00002	02258	20040	505	
00E03	X M X	20000	00880	00002	02258	20040	505	
00E03	X T X	20000	00880	00002	02258	20040	505	
00F0E	XXT	19900	0E008	00040	00BC2	20000	602	X
00FCF	X T X	38000	00085	00000	00E17	20044	506	
02A2C	XXM	39900	00808	00040	02A28	20004	512	
047F2	X D X	18000	11084	00000	00426	20040	213	
047F2	X M X	18000	11084	00000	00426	20040	213	
047F2	X T X	18000	11084	00000	00426	20040	213	
047F6	XXM	19999	11008	00040	00904	20004	226	
07C7C	X D X	3FC31	0080C	00000	12434	20000	413	
07C7C	X M X	3FC31	0080C	00000	12434	20000	413	
07C7C	X T X	3FC31	0080C	00000	12434	20000	413	
07FCA	X T X	38000	00085	00000	14F40	20040	503	
07FCE	X M X	38000	00084	00001	00F04	20044	312	
08980	XXM	19900	00009	00040	0897C	20004	215	

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
09394	X	M	X	3D203	0080C	00000	09393	20000 415
09858	XXT			39900	00808	00040	01854	20004 209
0993C	XXD			19900	0000A	00041	00F48	20000 511
0993C	XXM			19900	0000A	00041	00F48	20000 511
0993C	XXT			19900	00008	00041	08F48	20000 215
0993C	XXT			19900	0000A	00041	00F48	20000 511
0A938	XXT			39900	00808	00040	02934	20004 209
0AAAA	X	D	X	38910	00808	00000	0AAAA	20000 504
0AAAA	X	D	X	38910	00808	00004	0AAAA	20002 502
0AAAA	X	D	X	38911	00809	00004	0AAAA	20002 504
0AAAA	X	M	X	38910	00808	00000	0AAAA	20000 504
0AAAA	X	M	X	38910	00808	00004	0AAAA	20002 502
0AAAA	X	M	X	38911	00809	00004	0AAAA	20002 504
0AAAA	X	T	X	38910	00808	00000	0AAAA	20000 504
0AAAA	X	T	X	38910	00808	00004	0AAAA	20002 502
0AAAA	X	T	X	38911	00809	00004	0AAAA	20002 504
0B7E3	X	T	X	1F2E8	0000C	003C0	CYCLE	00020 413
0CE2C	X	T	X	20000	11885	00003	00F04	01040 211
0FAAE	X	M	X	1F5D0	3500F	00001	042E0	24000 403
0FBE3	X	D	X	CYCLE	0000C	00000	0FBE2	00000 413
0FBE3	X	D	X	CYCLE	0000C	00000	CYCLE	00000 413
0FBE3	X	M	X	CYCLE	0000C	00000	0FBE2	00000 413
0FBE3	X	M	X	CYCLE	0000C	00000	CYCLE	00000 413
0FBE3	X	T	X	CYCLE	0000C	00000	0FBE2	00000 413
0FBE3	X	T	X	CYCLE	0000C	00000	CYCLE	00000 413
0FBF5	X	M	X	1D581	1600D	00001	0FBF4	10004 502
0FFC3	X	D	X	CYCLE	0000C	00000	CYCLE	00000 402

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
0FFE3	X	M	X	CYCLE	0000C	00000	CYCLE	00000 402
0FFE3	X	T	X	CYCLE	0000C	00000	CYCLE	00000 402
10001	X	D	X	3D203	0080C	00000	00000	20000 418
10001	X	M	X	3D203	0080C	00000	00000	20000 418
10001	X	T	X	3D203	0080C	00000	00000	20000 418
10403	X	D	X	3FC51	0080C	00000	CYCLE	20001 405
10403	X	M	X	3FC51	0080C	00000	CYCLE	20001 405
10403	X	T	X	3FC51	0080C	00000	CYCLE	20001 405
1040B	X	D	X	3FC31	0040C	00000	17FFF	20001 512
1040B	X	M	X	3FC31	0040C	00000	17FFF	20001 512
1040B	X	T	X	3FC31	0040C	00000	17FFF	20001 512
113A3	X	D	X	00000	00880	00002	02248	20040 507
113A3	X	M	X	00000	00880	00002	02248	20040 217
113A3	X	M	X	00000	00880	00002	02248	20040 507
113A3	X	T	X	00000	00880	00002	02248	20040 507
11744	XXD			19900	00008	00040	00000	20000 504
11744	XXM			19900	00008	00040	00000	20000 504
11744	XXT			19900	00008	00040	00000	20000 504
11BE0	X	D	X	3D203	0080C	00000	10001	20000 408
11BE0	X	M	X	3D203	0080C	00000	10001	20000 408
11BE0	X	T	X	3D203	0080C	00000	10001	20000 408
1241F	X	D	X	3FC31	0080C	00000	00002	20001 406
1241F	X	M	X	3FC31	0080C	00000	00002	20001 406
1241F	X	T	X	3FC31	0080C	00000	00002	20001 406
12461	X	D	X	3FD20	0080C	00000	CYCLE	20000 417
12461	X	M	X	3FD20	0080C	00000	CYCLE	20000 417
12461	X	T	X	3FD20	0080C	00000	CYCLE	20000 417

D1 LSURL B1 C1 C3 D2 D3 FIG LOAD

1350A XXT 19999 00009 00040 0D01A 0000C 417
 CYCLE X D X 00A0F 00000 00003 00A68 20004 511
 CYCLE X D X 01BF7 00807 00000 10FE6 20000 510
 CYCLE X D X 18000 35084 00000 0D0E6 34040 654
 CYCLE X D X 18200 CYCLE 00005 CYCLE 20040 504
 CYCLE X D X 30203 0080C 00000 CYCLE 20000 411
 CYCLE X D X 3D203 0080C 00000 00000 00000 411
 CYCLE X D X 3D203 0080C 00000 00000 20000 411
 CYCLE X D X 3D203 0080C 00000 00000 20000 418
 CYCLE X D X 3D203 0080C 00000 02208 20000 413
 CYCLE X D X 3D203 0080C 00000 CYCLE 00000 402
 CYCLE X D X 3D203 0080C 00000 CYCLE 00000 417
 CYCLE X D X 3D203 0080C 00000 CYCLE 00020 406
 CYCLE X D X 3D203 0080C 00000 CYCLE 04020 414
 CYCLE X D X 3D203 0080C 00000 CYCLE 1E020 406
 CYCLE X D X 3D203 0080C 00000 CYCLE 20000 411
 CYCLE X D X 3D203 0080C 00000 CYCLE 20020 418
 CYCLE X D X 3D203 0080C 00000 CYCLE 21000 410
 CYCLE X D X 3D203 0080C 00000 CYCLE 2E000 401
 CYCLE X D X 3D203 0080C 00000 CYCLE 30020 418
 CYCLE X D X 3DC03 0080C 00000 CYCLE 411
 CYCLE X D X 3DC03 0080C 00000 CYCLE 20000 417
 CYCLE X D X 3DE07 0080C 00000 0250D 20000 417
 CYCLE X D X 3DE07 0080C 00000 0250F 20000 415
 CYCLE X D X 3F833 0080C 00000 CYCLE 00000 417
 CYCLE X D X 3F833 0080C 00000 CYCLE 26002 414
 CYCLE X D X 3F833 0080C 00000 CYCLE 26002 417
 CYCLE X D X 3FC31 0080C 00000 00000 20000 411

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
CYCLE	X	D	X	3FC31	0080C	00000	000FF	410
CYCLE	X	D	X	3FC31	0080C	00000	0242E	20000 417
CYCLE	X	D	X	3FC31	0080C	00000	CYCLE	00001 411
CYCLE	X	D	X	3FC31	0080C	00000	CYCLE	20000 411
CYCLE	X	D	X	3FC31	0080C	00000	CYCLE	20001 415
CYCLE	X	D	X	3FC31	0080C	00000	CYCLE	23000 413
CYCLE	X	D	X	3FD20	0080C	00000	02467	20000 411
CYCLE	X	D	X	CYCLE	0C084	00001	01030	20040 651
CYCLE	X	D	X	CYCLE	0E084	00000	CYCLE	20040 651
CYCLE	X	D	X	CYCLE	CYCLE	00000	0D41A	CYCLE 650
CYCLE	X	M	X	00000		00001	CYCLE	20040 507
CYCLE	X	M	X	00000	00084	00000	CYCLE	20064 610 X
CYCLE	X	M	X	00000	00084	00240	00000	00048 511
CYCLE	X	M	X	00000	00085	00000	104D4	20040 162
CYCLE	X	M	X	00000	00085	00000	104D4	20040 419
CYCLE	X	M	X	00000	00087	00001	CYCLE	00064 307 X
CYCLE	X	M	X	00A0F	00000	00003	00A68	20004 511
CYCLE	X	M	X	01BF7	00807	00000	10FE6	20000 510
CYCLE	X	M	X	060F0	0200C	00001	CYCLE	00064 210
CYCLE	X	M	X	060F0	0200E	00000	CYCLE	00060 210
CYCLE	X	M	X	0DC03	0080C	00000	CYCLE	00000 411
CYCLE	X	M	X	18200	CYCLE	00005	CYCLE	20040 504
CYCLE	X	M	X	1D2F0	0000F	07000	0F9FD	00018 500
CYCLE	X	M	X	30203	0090C	00000	CYCLE	20000 411
CYCLE	X	M	X	38000	00084	00000	10F04	10044 217
CYCLE	X	M	X	38000	00084	00000	16021	20040 290
CYCLE	X	M	X	38000	00085	00000	00F04	20044 505

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
CYCLE	X	M	X	38000	0E085	00001	00F00	20040 511
CYCLE	X	M	X	39900	0080A	00040	02030	20004 417
CYCLE	X	M	X	3D203	00000	0080C	CYCLE	00020 204
CYCLE	X	M	X	3D203	0080C	00000	00000	00000 411
CYCLE	X	M	X	3D203	0080C	00000	00000	20000 153
CYCLE	X	M	X	3D203	0080C	00000	00000	20000 411
CYCLE	X	M	X	3D203	0080C	00000	00000	20000 418
CYCLE	X	M	X	3D203	0080C	00000	022D8	20000 413
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	00000 402
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	00000 417
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	00020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	00020 406
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	00040 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	01020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	04020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	04020 414
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	08020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	09020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	0A020 288
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	11020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	11020 225
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	1E020 406
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	20000 411
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	20020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	20020 225
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	20020 418
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	20820 225
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	21000 410
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	28020 226
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	2D020 204

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	2E000 401
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	30020 204
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	30020 418
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	CYCLE 402
CYCLE	X	M	X	3D203	0080C	00000	CYCLE	CYCLE 410
CYCLE	X	M	X	3DC03	0080C	00000	CYCLE	20000 417
CYCLE	X	M	X	3DC03	0080C	00000	CYCLE	CYCLE 413
CYCLE	X	M	X	3DE07	0080C	00000	0250D	20000 417
CYCLE	X	M	X	3DE07	0080C	00000	0250F	20000 415
CYCLE	X	M	X	3F833	0080C	00000	CYCLE	00000 417
CYCLE	X	M	X	3F833	0080C	00000	CYCLE	26002 225
CYCLE	X	M	X	3F833	0080C	00000	CYCLE	26002 414
CYCLE	X	M	X	3F833	0080C	00000	CYCLE	26002 417
CYCLE	X	M	X	3FC31	0080C	00000	00000	20000 411
CYCLE	X	M	X	3FC31	0080C	00000	000FF	410
CYCLE	X	M	X	3FC31	0080C	00000	0242E	20000 417
CYCLE	X	M	X	3FC31	0080C	00000	CYCLE	00001 411
CYCLE	X	M	X	3FC31	0080C	00000	CYCLE	20000 411
CYCLE	X	M	X	3FC31	0080C	00000	CYCLE	20001 415
CYCLE	X	M	X	3FC31	0080C	00000	CYCLE	23000 413
CYCLE	X	M	X	3FC51	0080C	00000	02434	20000 412
CYCLE	X	M	X	3FD20	0080C	00000	02467	20000 411
CYCLE	X	M	X	3FD20	0080C	00001	00800	10A20 410
CYCLE	X	M	X	CYCLE	00809	00001	0128C	20000 285
CYCLE	X	M	X	CYCLE	0080C	00000	CYCLE	26002 226
CYCLE	X	T	X	00000	00084	00000	00000	20040 511
CYCLE	X	T	X	00000	00084	00001	CYCLE	00060 610 X
CYCLE	X	T	X	00000	00085	00000	10404	20040 419
CYCLE	X	T	X	00000	000C6	00001	CYCLE	00040 650

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
CYCLE	X	T	X	00000	300A4	00001	00000	00040 650
CYCLE	X	T	X	00000	340C7	00001	04280	20040 613
CYCLE	X	T	X	00A0F	00000	00003	00A68	20004 511
CYCLE	X	T	X	018F7	00807	00000	10FE6	20000 510
CYCLE	X	T	X	047F0	0E008	00000	00F04	00020 621
CYCLE	X	T	X	0DC03	0080C	00000	CYCLE	00000 411
CYCLE	X	T	X	18200	CYCLE	00005	CYCLE	20040 504
CYCLE	X	T	X	1D2F0	0000F	07000	0F1F5	00018 500
CYCLE	X	T	X	1D5D5	3504C	00001	CYCLE	CYCLE 654
CYCLE	X	T	X	1FDD0	0000D	00041	CYCLE	24000 403
CYCLE	X	T	X	30203	0080C	00000	CYCLE	00020 406
CYCLE	X	T	X	30203	0090C	00000	CYCLE	20000 411
CYCLE	X	T	X	38000	00087	00001	00F04	20040 203
CYCLE	X	T	X	38000	0E085	00001	00F00	20040 511
CYCLE	X	T	X	3D203	0080C	00000	00000	00000 411
CYCLE	X	T	X	3D203	0080C	00000	00000	20000 411
CYCLE	X	T	X	3D203	0080C	00000	00000	20000 418
CYCLE	X	T	X	3D203	0080C	00000	02208	20000 413
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	00000 402
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	00000 417
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	04020 414
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	1E020 406
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	20000 411
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	20020 418
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	21000 410
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	2E000 401
CYCLE	X	T	X	3D203	0080C	00000	CYCLE	30020 418

D1	LSURL	B1	C1	C3	D2	D3	FIG	LOAD
CYCLE	X	T	X	3DC03	0080C	00000	CYCLE	20000 417
CYCLE	X	T	X	3DE07	0080C	00000	0250D	20000 417
CYCLE	X	T	X	3DE07	0080C	00000	0250F	20000 415
CYCLE	X	T	X	3F833	0080C	00000	0235B	20004 417
CYCLE	X	T	X	3F833	0080C	00000	CYCLE	00000 417
CYCLE	X	T	X	3F833	0080C	00000	CYCLE	26002 414
CYCLE	X	T	X	3F833	0080C	00000	CYCLE	26002 417
CYCLE	X	T	X	3FC31	0080C	00000	00000	20000 411
CYCLE	X	T	X	3FC31	0080C	00000	000FF	410
CYCLE	X	T	X	3FC31	0080C	00000	0242E	20000 417
CYCLE	X	T	X	3FC31	0080C	00000	CYCLE	00001 411
CYCLE	X	T	X	3FC31	0080C	00000	CYCLE	20000 411
CYCLE	X	T	X	3FC31	0080C	00000	CYCLE	20001 415
CYCLE	X	T	X	3FC31	0080C	00000	CYCLE	23000 413
CYCLE	X	T	X	3FD20	0080C	00000	02467	20000 411
CYCLE	X	T	X	CYCLE	0000D	00000	CYCLE	20000 658 X
CYCLE	X	T	X	CYCLE	00084	00000	00F88	20044 616
CYCLE	X	T	X	CYCLE	0C084	00000	CYCLE	20040 651
CYCLE	X	T	X	CYCLE	0C084	00001	01030	20040 651
CYCLE	X	T	X	CYCLE	340E5	00001	CYCLE	34040 650
CYCLE	X	T	X	CYCLE	CYCLE	00000	CYCLE	00040 654
CYCLE	X	T	X	CYCLE	CYCLE	00000	CYCLE	20000 614 X
CYCLE	X	T	X	CYCLE	CYCLE	CYCLE	CYCLE	CYCLE 610 X
CYCLE	XXD		19900	00008	00041	0007A	00028	413
CYCLE	XXD		19900	00008	00041	CYCLE	00000	401
CYCLE	XXM		19900	00008	00041	0007A	00028	413
CYCLE	XXM		19900	00008	00041	CYCLE	00000	401

D1 LSURL B1 C1 C3 D2 D3 FIG LOAD

CYCLE XXM 39900 00009 007DA CYCLE 00020 504

CYCLE XXT 19900 00008 00041 0007A 00028 413

CYCLE XXT 19900 00008 00041 CYCLE 00000 401

5-6. DMR FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions detected by the CPU Test portion of the DMR program. These malfunctions cause an error stop or loop condition with the D1 display equal to 01000 through 02FFF after a successful load.

To utilize this data perform the following steps:

- Step 1. Record hexadecimal values observed in D1, A2, B3, C1, C3, and D3 displays.
- Step 2. Construct LSURL field by means of the following:
 - a) Record an X in left-most L position to designate a successful load.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) What loading device was used? If Selector Channel tape unit, record a T in U position; if Selector Channel disc unit, record a D in U position; if Multiplexer Channel tape unit, record an M in U position.
- Step 3. Construct LOAD field by means of the following:
 - a) Is LOAD WAIT indicator lit? If yes, record an X in L position; if no, leave L position blank.
 - b) Is LOAD NO DATA indicator lit? If yes, record an X in O position; if no, leave O position blank.
 - c) Is LOAD CHECK indicator lit? If yes, record an X in A position; if no, leave A position blank.
 - d) Is LOAD SUBSYSTEM CHECK indicator lit? If yes, record an X in D position; if no, leave D position blank.
- Step 4. Locate corresponding values in DMR formatted list by first matching D1 display value with D1 in list. Then match constructed LSURL field with LSURL column in list. Next match A2 display value with A2 in list, then match B3 display value with B3 in list, etc., ignoring any blank columns. Finally, match constructed LOAD field with LOAD column in list.

NOTE

Due to a machine discrepancy during the malfunction simulation phase of the diagnostic's development the two right-most digit positions of the A2 display were indicated as 9F instead of the correct value of FF. This discrepancy was inadvertently interjected into the simulation data and subsequent documentation; consequently, any 9F appearing in the two right-most digit positions of the A2 column should be interpreted as FF.

- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5. Then replace specified card(s).

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
01004	XXD		00000	0E008	00040	20000	611	
01008	XXM	0009F	00000	02008	00041	20000	209	
0100A	X T X	0009F	00000	0C00C	00000	20000	651	
0100E	X D X	0009F	00000	0E00C	00000	20000	651	
01018	XXM	0009F	00000	0E008	00041	20000	506	X
01026	X T X	0009F	00000	0C008	00000	20003	653	
01030	XXD	0009F	00000	02008	00040	20004	513	
01030	XXD	0009F	00000	0C009	00040	20004	203	
01030	XXM	0009F	00000	02008	00040	20004	513	
01030	XXM	0009F	00000	0C009	00040	20004	203	
01030	XXT	0009F	00000	02008	00040	20004	513	
01030	XXT	0009F	00000	0C009	00040	20004	203	
01034	XXT	0009F	00000	0C008	00040	20004	653	
01046	XXD	0009F	00000	02009	00040	20004	513	
01046	XXM	0009F	00000	02009	00040	20004	513	
01046	XXT		00000	0E00A	00040	20004	601	X
01046	XXT	0009F	00000	02009	00040	20004	513	
0104E	X D X	0009F	00000	0C004	00000	20000	652	
0104E	X T X	0009F	00000	0C004	00000	20000	652	
01084	XXD	0009F	00000	00008	00040	20004	505	
01096	XXD	0009F	00000	0200A	00040	20004	513	
01096	XXM	0009F	00000	0200A	00040	20004	513	
01096	XXT	0009F	00000	0200A	00040	20004	513	
0109A	XXD	0009F	00000	02008	00040	20004	517	
0109A	XXM	0009F	00000	02008	00040	20004	517	
0109A	XXT	0009F	00000	02008	00040	20004	517	
010AE	XXM	0009F	00000	00809	00040	20004	505	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
010AE	XXT	0009F	00000	0C00A	00040	20004	505	
010BE	XXD	0009F	00000	02009	00040	20004	513	
010BE	XXM	0009F	00000	02009	00040	20004	513	
010BE	XXT	0009F	00000	02009	00040	20004	513	
010C6	X D X	0009F	00000	0C008	00000	20000	503	
010C6	X M X	0009F	00000	0C008	00000	20000	503	
010C6	X T X	0009F	00000	0C008	00000	20000	503	
010D6	XXD	0009F	00000	00808	00040	00004	508	
010D6	XXD	0009F	00000	00808	00040	20004	508	
010D6	XXD	0009F	00000	0C00A	00040	20004	505	
010D6	XXD	0009F	00000	0C00A	00040	20004	510	
010D6	XXM	0009F	00000	00808	00040	00004	508	
010D6	XXM	0009F	00000	00808	00040	20004	508	
010D6	XXM	0009F	00000	0200A	00040	20004	509	
010D6	XXM	0009F	00000	0C00A	00040	20004	505	
010D6	XXM	0009F	00000	0C00A	00040	20004	510	
010D6	XXT	0009F	00000	00808	00040	00004	508	
010D6	XXT	0009F	00000	00808	00040	20004	508	
010D6	XXT	0009F	00000	0C00A	00040	20004	505	
010D6	XXT	0009F	00000	0C00A	00040	20004	510	
010FE	X D X	0009F	00000	00808	00000	20000	210	
010FE	X M X	0009F	00000	00808	00000	20000	210	
010FE	X T X	0009F	00000	00808	00000	20000	210	
01110	X D X	0009F	00000	0C004	00000	20000	503	
01110	X M X	0009F	00000	0C004	00000	20000	503	
01110	X T X	0009F	00000	0C004	00000	20000	503	
01118	XXD	0009F	00000	0C00A	00040	20000	510	
01118	XXD	0009F	00000	0C00A	00040	20000	511	
01118	XXM	0009F	00000	0C00A	00040	20000	510	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
01118	XXM	0009F	00000	0C00A	00040	20000	511	
01118	XXT	0009F	00000	0C00A	00040	20000	510	
01118	XXT	0009F	00000	0C00A	00040	20000	511	
0112E	XXD	0009F	00000	1F809	00041	00000	506	
0112E	XXD	0009F	00000	1F80A	00040	20000	500	
0112E	XXD	0009F	00000	1F80A	00040	20000	503	
0112E	XXM	0009F	00000	00008	00040	20000	211	
0112E	XXM	0009F	00000	1F809	00041	00000	506	
0112E	XXM	0009F	00000	1F80A	00040	20000	500	
0112E	XXM	0009F	00000	1F80A	00040	20000	503	
0112E	XXM	0009F	00000	1F80F	00040	20000	295	
0112E	XXT	0009F	00000	0000A	00040	35000	213	
0112E	XXT	0009F	00000	1F809	00041	00000	506	
0112E	XXT	0009F	00000	1F80A	00040	20000	500	
0112E	XXT	0009F	00000	1F80A	00040	20000	503	
0112F	XXT	0009F	00000	1F809	00040	20000	214	
01144	XXD	0009F	00000	1F80A	00040	20000	503	
01144	XXD	0009F	00000	1F80A	00040	20000	515	
01144	XXM	0009F	00000	0000A	00040	20000	213	
01144	XXM	0009F	00000	1F80A	00040	20000	245	
01144	XXM	0009F	00000	1F80A	00040	20000	288	
01144	XXM	0009F	00000	1F80A	00040	20000	503	
01144	XXM	0009F	00000	1F80A	00040	20000	515	
01144	XXT	0009F	00000	1F80A	00040	20000	503	
01144	XXT	0009F	00000	1F80A	00040	20000	515	
01184	X D X	0009F	00000	0000C	00000	20000	509	
01184	X M X	0009F	00000	0000C	00000	20000	509	
01184	X T X	0009F	00000	0000C	00000	20000	509	
01194	XXD	0009F	00000	00009	00040	20004	209	
01194	XXD	0009F	00000	00009	00040	20004	210	
01194	XXD	0009F	00000	00009	00040	20004	403	
01194	XXD	0009F	00000	00009	00040	20004	503	
01194	XXD	0009F	00000	0E009	00040	20004	508	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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01194	XXM	0009F	00000	00001	00040	20004	295	
01194	XXM	0009F	00000	00009	00040	20004	209	
01194	XXM	0009F	00000	00009	00040	20004	210	
01194	XXM	0009F	00000	00009	00040	20004	239	
01194	XXM	0009F	00000	00009	00040	20004	240	
01194	XXM	0009F	00000	00009	00040	20004	241	
01194	XXM	0009F	00000	00009	00040	20004	242	
01194	XXM	0009F	00000	00009	00040	20004	295	
01194	XXM	0009F	00000	00009	00040	20004	403	
01194	XXM	0009F	00000	00009	00040	20004	503	
01194	XXM	0009F	00000	0000D	00040	20004	295	
01194	XXM	0009F	00000	02009	00040	20004	241	
01194	XXM	0009F	00000	0E009	00040	20004	508	
01194	XXM	0009F	00000	3F809	00040	20004	295	
01194	XXT	0009F	00000	00009	00040	20004	209	
01194	XXT	0009F	00000	00009	00040	20004	210	
01194	XXT	0009F	00000	00009	00040	20004	403	
01194	XXT	0009F	00000	00009	00040	20004	503	
01194	XXT	0009F	00000	0E009	00040	20004	508	
0119A	X T X	0009F	00000	00000	00000	20000	213	
011A4	X M X	0009F	00000	00D00	00002	20040	407	
011AE	X D X	0009F	00000	00800	00002	20040	515	
011AE	X D X	0009F	00000	00880	00002	20040	516	
011AE	X D X	0009F	00000	00900	00002	20040	516	
011AE	X D X	0009F	00000	00A00	00002	20040	516	
011AE	X D X	0009F	00000	00C00	00002	20040	516	
011AE	X M X	0009F	00000	00800	00002	20040	515	
011AE	X M X	0009F	00000	00880	00002	20040	244	
011AE	X M X	0009F	00000	00880	00002	20040	516	
011AE	X M X	0009F	00000	00900	00002	20040	244	
011AE	X M X	0009F	00000	00900	00002	20040	516	
011AE	X M X	0009F	00000	00A00	00002	20040	243	
011AE	X M X	0009F	00000	00A00	00002	20040	516	
011AE	X M X	0009F	00000	00C00	00002	20040	243	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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011AE	X M X	0009F	00000	00C00	00002	20040	516
011AE	X M X	0009F	00000	00D80	00002	20040	407
011AE	X T X	0009F	00000	00800	00002	20040	515
011AE	X T X	0009F	00000	00880	00002	20040	516
011AE	X T X	0009F	00000	00900	00002	20040	516
011AE	X T X	0009F	00000	00A00	00002	20040	516
011AE	X T X	0009F	00000	00C00	00002	20040	516
011AE	X T X	0009F	00000	00D00	00002	20040	407
011AE	X T X	0009F	00000	00D80	00002	20040	407
011AE	XXD	0009F	00000	00009	00040	20004	209
011AE	XXD	0009F	00000	00009	00040	20004	210
011AE	XXD	0009F	00000	0000D	00040	20004	503
011AE	XXM	0009F	00000	00009	00040	20004	209
011AE	XXM	0009F	00000	00009	00040	20004	210
011AE	XXM	0009F	00000	00009	00040	20004	241
011AE	XXM	0009F	00000	00009	00040	20004	242
011AE	XXM	0009F	00000	00009	00040	20004	295
011AE	XXM	0009F	00000	0000D	00040	20004	239
011AE	XXM	0009F	00000	0000D	00040	20004	503
011AE	XXM	0009F	00000	03009	00040	20004	241
011AE	XXM	0009F	00000	1F809	00040	20004	295
011AE	XXT	0009F	00000	00009	00040	20004	209
011AE	XXT	0009F	00000	00009	00040	20004	210
011AE	XXT	0009F	00000	0000D	00040	20004	503
011B2	XXD	0009F	00000	00808	00040	20004	516
011B2	XXM	0009F	00000	00808	00040	20004	212
011B2	XXM	0009F	00000	00808	00040	20004	516
011B2	XXT	0009F	00000	00808	00040	20004	516
01202	XXM	0009F	00000	1F808	00040	20004	239
01202	XXM	0009F	00000	1F808	00040	20004	240
01202	XXM	0009F	00000	1F808	00040	20004	241
01202	XXM	0009F	00000	1F808	00040	20004	242
01202	XXM	0009F	00000	1F808	00040	20004	243

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01202	XXM	0009F	00000	1F808	00040	20004	244
01202	XXM	0009F	00000	1F808	00040	20004	245
01202	XXM	0009F	00000	1F808	00040	20004	246
01202	XXM	0009F	00000	1F808	00040	20004	287
01202	XXM	0009F	00000	1F808	00040	20004	403
01202	XXT	0009F	00000	1F808	00040	20040	403
0120A	XXD	0009F	00000	0080A	00040	20004	417
0120A	XXM	0009F	00000	0080A	00040	20004	417
0120A	XXT	0009F	00000	0080A	00040	20004	417
0122C	XXM	0009F	00000	00802	00040	20004	239
0122C	XXM	0009F	00000	0080A	00040	20004	239
0122C	XXM	0009F	00000	0080A	00040	20004	240
0122C	XXM	0009F	00000	0080A	00040	20004	241
0122C	XXM	0009F	00000	0080A	00040	20004	242
0122C	XXM	0009F	00000	0080A	00040	20004	243
0122C	XXM	0009F	00000	0080A	00040	20004	244
0122C	XXM	0009F	00000	0080A	00040	20004	245
0122C	XXM	0009F	00000	0080A	00040	20004	246
0122C	XXT	0009F	00000	0080A	00040	20004	209
0122C	XXT	0009F	00000	1600A	00041	20000	502
0126A	XXM	0009F	00000	00008	00040	20004	212
012A0	XXD	0009F	00000	00008	00040	20004	203
012A0	XXM	0009F	00000	00008	00040	20004	203
012A0	XXT	0009F	00000	00008	00040	20004	203
012B8	XXM	0009F	00000	02008	00040	20004	315
012BC	XXD	0009F	00000	00808	00040	20004	515
012BC	XXD	0009F	00000	00808	00040	20004	516
012BC	XXM	0009F	00000	00808	00040	20004	244
012BC	XXM	0009F	00000	00808	00040	20004	515
012BC	XXM	0009F	00000	00808	00040	20004	516
012BC	XXT	0009F	00000	00808	00040	20004	515
012BC	XXT	0009F	00000	00808	00040	20004	516
012D0	XXD	0009F	00000	0080A	00041	20000	211
012D0	XXM	0009F	00000	00809	00040	20000	162
012D0	XXM	0009F	00000	00809	00040	20000	212

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
012D0	XXM	0009F	00000	0080A	00040	20000	211
012D0	XXM	0009F	00000	0080A	00041	20000	211
012D0	XXM	0009F	00000	0080A	00041	20000	212
012D0	XXT	0009F	00000	0080A	00041	20000	211
012E8	XXD	0009F	00000	0080A	00040	20004	516
012E8	XXM	0009F	00000	0080A	00040	20004	516
012E8	XXT	0009F	00000	0080A	00040	20004	516
012FC	XXD	0009F	00000	00809	00040	20000	516
012FC	XXM	0009F	00000	00809	00040	20000	211
012FC	XXM	0009F	00000	00809	00040	20000	212
012FC	XXM	0009F	00000	00809	00040	20000	243
012FC	XXM	0009F	00000	00809	00040	20000	244
012FC	XXM	0009F	00000	00809	00040	20000	516
012FC	XXM	0009F	00000	0080A	00040	20000	212
012FC	XXT	0009F	00000	00809	00040	20000	516
0131C	XXD	0009F	00000	00008	00040	20004	507
0131C	XXD	0009F	00000	00808	00040	20004	509
0131C	XXD	0009F	00000	00808	00040	20004	517
0131C	XXM	0009F	00000	00008	00040	20004	507
0131C	XXM	0009F	00000	00808	00040	20004	509
0131C	XXM	0009F	00000	00808	00040	20004	517
0131C	XXT	0009F	00000	00008	00040	20004	507
0131C	XXT	0009F	00000	00808	00040	20004	509
0131C	XXT	0009F	00000	00808	00040	20004	517
0132E	XXD	0009F	00000	00809	00040	20000	214
0132E	XXD	0009F	00000	00809	00040	20000	508
0132E	XXD	0009F	00000	00809	00040	20000	213
0132E	XXD	0009F	00000	00809	00041	20000	214
0132E	XXM	0009F	00000	00809	00040	20000	214
0132E	XXM	0009F	00000	00809	00040	20000	508
0132E	XXM	0009F	00000	00809	00040	20000	213
0132E	XXM	0009F	00000	00809	00041	20000	214

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
0132E	XXM	0009F	00000	00849	00040	20000	245
0132E	XXT	0009F	00000	00809	00040	20000	214
0132E	XXT	0009F	00000	00809	00040	20000	508
0132E	XXT	0009F	00000	00809	00040	20000	213
0132E	XXT	0009F	00000	00809	00041	20000	214
0133E	XXD	0009F	00000	00809	00040	20000	507
0133E	XXD	0009F	00000	00809	00040	20000	513
0133E	XXM	0009F	00000	00008	00040	20004	510
0133E	XXM	0009F	00000	00809	00040	20000	216
0133E	XXM	0009F	00000	00809	00040	20000	507
0133E	XXM	0009F	00000	00809	00040	20000	513
0133E	XXT	0009F	00000	00809	00040	20000	507
0133E	XXT	0009F	00000	00809	00040	20000	510
0133E	XXT	0009F	00000	00809	00040	20000	513
01364	XXD	0009F	00000	00809	00040	20004	213
01364	XXD	0009F	00000	00809	00040	20004	214
01364	XXD	0009F	00000	00809	00040	20004	508
01364	XXM	0009F	00000	00809	00040	20004	213
01364	XXM	0009F	00000	00809	00040	20004	214
01364	XXM	0009F	00000	00809	00040	20004	245
01364	XXM	0009F	00000	00809	00040	20004	246
01364	XXM	0009F	00000	00809	00040	20004	295
01364	XXM	0009F	00000	00809	00040	20004	508
01364	XXT	0009F	00000	00809	00040	20004	213
01364	XXT	0009F	00000	00809	00040	20004	214
01364	XXT	0009F	00000	00809	00040	20004	508
0139A	XXD	0009F	00000	00808	00040	20004	509
0139A	XXM	0009F	00000	00808	00040	20004	509
0139A	XXT	0009F	00000	00808	00040	20000	509
013AA	X M X	0009F	00000	00970	00003	20040	295
013AB	XXD	0009F	00000	0080A	00040	20000	516
013AB	XXM	0009F	00000	0080A	00040	20000	516
013AB	XXT	0009F	00000	0080A	00040	20000	516
013AE	XXD	0009F	00000	0080A	00040	20000	515

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
013AE	XXM	0009F	00000	00809	00040	20000	209
013AE	XXM	0009F	00000	0080A	00040	20000	162
013AE	XXM	0009F	00000	0080A	00040	20000	515
013AE	XXT	0009F	00000	0080A	00040	20000	515
013B2	XXD	0009F	00000	00808	00040	20004	215
013B2	XXD	0009F	00000	00808	00040	20004	502
013B2	XXD	0009F	00000	00808	00040	20004	504
013B2	XXD	0009F	00000	00808	00040	20004	505
013B2	XXD	0009F	00000	00808	00040	20004	507
013B2	XXD	0009F	00000	00808	00040	20004	516
013B2	XXD	0009F	00000	00808	00040	20004	517
013B2	XXD	0009F	00000	00808	00080	20004	503
013B2	XXM	0009F	00000	00808	00040	20004	215
013B2	XXM	0009F	00000	00808	00040	20004	216
013B2	XXM	0009F	00000	00808	00040	20004	217
013B2	XXM	0009F	00000	00808	00040	20004	225
013B2	XXM	0009F	00000	00808	00040	20004	285
013B2	XXM	0009F	00000	00808	00040	20004	502
013B2	XXM	0009F	00000	00808	00040	20004	504
013B2	XXM	0009F	00000	00808	00040	20004	505
013B2	XXM	0009F	00000	00808	00040	20004	507
013B2	XXM	0009F	00000	00808	00040	20004	516
013B2	XXM	0009F	00000	00808	00040	20004	517
013B2	XXM	0009F	00000	00808	00080	20004	503
013B2	XXT	0009F	00000	00808	00040	20000	215
013B2	XXT	0009F	00000	00808	00040	20004	215
013B2	XXT	0009F	00000	00808	00040	20004	502
013B2	XXT	0009F	00000	00808	00040	20004	504
013B2	XXT	0009F	00000	00808	00040	20004	505
013B2	XXT	0009F	00000	00808	00040	20004	507
013B2	XXT	0009F	00000	00808	00040	20004	516
013B2	XXT	0009F	00000	00808	00040	20004	517
013B2	XXT	0009F	00000	00808	00080	20004	503
013EE	XXD	0009F	00000	0080A	00040	20004	213
013EE	XXM	0009F	00000	0080A	00040	20004	213
013EE	XXT	0009F	00000	0080A	00040	20004	213
01446	XXD	0009F	00000	00808	00040	20004	502
01446	XXD	0009F	00000	00808	00040	20004	513
01446	XXD	0009F	00000	00808	00040	20004	517

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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01446	XXM	0009F	00000	00808	00040	20004	243
01446	XXM	0009F	00000	00808	00040	20004	244
01446	XXM	0009F	00000	00808	00040	20004	245
01446	XXM	0009F	00000	00808	00040	20004	246
01446	XXM	0009F	00000	00808	00040	20004	254
01446	XXM	0009F	00000	00808	00040	20004	502
01446	XXM	0009F	00000	00808	00040	20004	513
01446	XXM	0009F	00000	00808	00040	20004	517

01446	XXT	0009F	00000	00808	00040	20004	502
01446	XXT	0009F	00000	00808	00040	20004	513
01446	XXT	0009F	00000	00808	00040	20004	517

01452	XXD	0009F	00000	00809	00040	20004	403
01452	XXD	0009F	00000	00809	00040	20004	513

01452	XXD	0009F	00000	00809	00040	20040	403
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01452	XXD	0009F	00000	00808	00040	20004	203
01452	XXD	0009F	00000	00808	00040	20004	505
01452	XXD	0009F	00000	00808	00040	20004	506
01452	XXD	0009F	00000	00808	00040	20004	509
01452	XXD	0009F	00000	00808	00040	20004	510
01452	XXD	0009F	00000	00808	00040	20004	517

01452	XXD	0009F	00000	00808	00040	20040	513
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01452	XXM	0009F	00000	00809	00040	20004	243
01452	XXM	0009F	00000	00809	00040	20004	244
01452	XXM	0009F	00000	00809	00040	20004	245
01452	XXM	0009F	00000	00809	00040	20004	246
01452	XXM	0009F	00000	00809	00040	20004	287
01452	XXM	0009F	00000	00809	00040	20004	403
01452	XXM	0009F	00000	00809	00040	20004	513

01452	XXM	0009F	00000	00809	00040	20040	403
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01452	XXM	0009F	00000	00808	00040	20004	203
01452	XXM	0009F	00000	00808	00040	20004	505
01452	XXM	0009F	00000	00808	00040	20004	506
01452	XXM	0009F	00000	00808	00040	20004	509
01452	XXM	0009F	00000	00808	00040	20004	510
01452	XXM	0009F	00000	00808	00040	20004	517

01452	XXM	0009F	00000	00808	00040	20040	513
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01452	XXT	0009F	00000	00809	00040	20004	403
01452	XXT	0009F	00000	00809	00040	20004	513

01452	XXT	0009F	00000	00809	00040	20040	403
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01452	XXT	0009F	00000	00808	00040	20004	203
01452	XXT	0009F	00000	00808	00040	20004	505

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01452	XXT	0009F	00000	0080B	00040	20004	506
01452	XXT	0009F	00000	0080B	00040	20004	509
01452	XXT	0009F	00000	0080B	00040	20004	510
01452	XXT	0009F	00000	0080B	00040	20004	517
01452	XXT	0009F	00000	0080B	00040	20040	513
0145E	XXD	0009F	00000	00808	00040	20004	505
0145E	XXD	0009F	00000	00808	00040	20004	506
0145E	XXD	0009F	00000	00808	00040	20004	510
0145E	XXM	0009F	00000	00808	00040	20004	505
0145E	XXM	0009F	00000	00808	00040	20004	506
0145E	XXM	0009F	00000	00808	00040	20004	510
0145E	XXT	0009F	00000	00808	00040	20004	505
0145E	XXT	0009F	00000	00808	00040	20004	506
0145E	XXT	0009F	00000	00808	00040	20004	510
01476	XXD	0009F	00000	00809	00040	20004	511
01476	XXD	0009F	00000	0080A	00040	20004	513
01476	XXM	0009F	00000	00809	00040	20004	511
01476	XXM	0009F	00000	0080A	00040	20004	513
01476	XXT	0009F	00000	00809	00040	20004	511
01476	XXT	0009F	00000	0080A	00040	20004	513
0148A	XXD	0009F	00000	00808	00040	20004	209
0148A	XXD	0009F	00000	00808	00040	20004	210
0148A	XXD	0009F	00000	00808	00040	20004	511
0148A	XXD	0009F	00000	00808	00040	20004	516
0148A	XXM	0009F	00000	00808	00040	20004	209
0148A	XXM	0009F	00000	00808	00040	20004	210
0148A	XXM	0009F	00000	00808	00040	20004	511
0148A	XXM	0009F	00000	00808	00040	20004	516
0148A	XXT	0009F	00000	00808	00040	20004	209
0148A	XXT	0009F	00000	00808	00040	20004	210
0148A	XXT	0009F	00000	00808	00040	20004	511
0148A	XXT	0009F	00000	00808	00040	20004	516
0149E	XXD	0009F	00000	00809	00040	20000	509
0149E	XXM	0009F	00000	00809	00040	20000	509
0149E	XXT	0009F	00000	00809	00040	20000	509
014DC	XXD	0009F	00000	0080A	00040	20004	203

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
014DC	XXD	0009F	00000	0080A	00040	20004	404	
014DC	XXD	0009F	00000	0080A	00040	20004	511	
014DC	XXM	0009F	00000	0080A	00040	20004	203	
014DC	XXM	0009F	00000	0080A	00040	20004	404	
014DC	XXM	0009F	00000	0080A	00040	20004	511	
014DC	XXT	0009F	00000	0080A	00040	20004	203	
014DC	XXT	0009F	00000	0080A	00040	20004	404	
014DC	XXT	0009F	00000	0080A	00040	20004	511	
014FA	XXD	0009F	00000	00809	00040	20004	507	
014FA	XXD	0009F	00000	00809	00040	20004	511	
014FA	XXM	0009F	00000	00809	00040	20004	507	
014FA	XXM	0009F	00000	00809	00040	20004	511	
014FA	XXT	0009F	00000	00809	00040	20004	507	
014FA	XXT	0009F	00000	00809	00040	20004	511	
014FE	X D X	0009F	00000	00807	00000	00000	506	
014FE	X M X	0009F	00000	00807	00000	00000	506	
014FE	X T X	0009F	00000	00807	00000	00000	506	
0150C	XXD	0009F	00000	00802	00040	20004	503	
0150C	XXD	0009F	00000	0080E	00040	20004	503	
0150C	XXM	0009F	00000	00802	00040	20004	239	
0150C	XXM	0009F	00000	00802	00040	20004	503	
0150C	XXM	0009F	00000	0080E	00040	20004	295	
0150C	XXM	0009F	00000	0080E	00040	20004	503	
0150C	XXT	0009F	00000	00802	00040	20004	503	
0150C	XXT	0009F	00000	0080E	00040	20004	503	
0154C	XXT	0009F	00000	0000A	00040	20004	417	
01554	XXM	0009F	00000	00008	00040	00020	616	
01558	XXD	0009F	00000	00008	00040	20004	215	
01558	XXM	0009F	00000	00008	00040	20004	215	
01558	XXT	0009F	00000	00008	00040	20004	215	
0156A	XXD	0009F	00000	00809	00040	20004	503	
0156A	XXM	0009F	00000	00809	00040	20004	239	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
0156A	XXM	0009F	00000	00809	00040	20004	503	
0156A	XXT	0009F	00000	00809	00040	20004	503	
01594	XXD	0009F	00000	0080A	00040	20004	517	
01594	XXM	0009F	00000	0080A	00040	20004	517	
01594	XXT	0009F	00000	0080A	00040	20004	517	
015B6	XXM	0009F	00000	00809	00040	20004	254	
01610	X D X	0009F	00000	00880	0000C	20040	608	
01610	X T X	0009F	00000	00880	0000C	20040	608	
01646	XXD	0009F	00000	00808	00040	20004	510	
01646	XXD	0009F	00000	00808	00040	20004	516	
01646	XXM	0009F	00000	00808	00040	20004	510	
01646	XXM	0009F	0000Q	00808	00040	20004	516	
01646	XXT	0009F	00000	00808	00040	20004	510	
01646	XXT	0009F	00000	00808	00040	20004	516	
01680	XXD	0009F	00000	00808	00040	20004	513	
01680	XXD	0009F	00000	00809	00040	20004	513	
01680	XXD	0009F	00000	0080B	00040	20004	515	
01680	XXD	0009F	00000	0080B	00040	20004	516	
01680	XXM	0009F	00000	00808	00040	20004	513	
01680	XXM	0009F	00000	00809	00040	20004	513	
01680	XXM	0009F	00000	0080B	00040	20004	243	
01680	XXM	0009F	00000	0080B	00040	20004	515	
01680	XXM	0009F	00000	0080B	00040	20004	516	
01680	XXT	0009F	00000	00808	00040	20004	513	
01680	XXT	0009F	00000	00809	00040	20004	513	
01680	XXT	0009F	00000	0080B	00040	20004	515	
01680	XXT	0009F	00000	0080B	00040	20004	516	
016A8	XXD	0009F	00000	0080A	00040	20004	513	
016A8	XXM	0009F	00000	0080A	00040	20004	513	
016A8	XXT	0009F	00000	0080A	00040	20004	513	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
016FA	XXD	0009F	00000	00918	00040	20044	516	
016FA	XXM	0009F	00000	00918	00040	20044	516	
016FA	XXT	0009F	00000	00918	00040	20044	516	
017C2	XXD	0009F	00000	0080B	00040	20004	513	
017C2	XXM	0009F	00000	0080B	00040	20004	513	
017C2	XXT	0009F	00000	0080B	00040	20004	513	
01806	XXD	0009F	00000	00808	00040	20004	513	
01806	XXM	0009F	00000	00808	00040	20004	513	
01806	XXT	0009F	00000	00808	00040	20004	513	
0182A	XXD	0009F	00000	0080A	00040	20004	510	
0182A	XXD	0009F	00000	0080A	00040	20004	517	
0182A	XXM	0009F	00000	0080A	00040	20004	510	
0182A	XXM	0009F	00000	0080A	00040	20004	517	
0182A	XXT	0009F	00000	0080A	00040	20004	510	
0182A	XXT	0009F	00000	0080A	00040	20004	517	
01832	XXD	0009F	00000	00808	00040	20004	506	
01832	XXD	0009F	00000	00808	00040	20004	510	
01832	XXM	0009F	00000	00808	00040	20004	506	
01832	XXM	0009F	00000	00808	00040	20004	510	
01832	XXT	0009F	00000	00808	00040	20004	506	
01832	XXT	0009F	00000	00808	00040	20004	510	
01854	XXD	0009F	00000	00808	00040	20004	509	
01854	XXM	0009F	00000	00808	00040	20004	509	
01854	XXT	0009F	00000	00808	00040	20004	509	
01882	XXM	0009F	00000	00009	00040	20004	162	
01886	XXD	0009F	00000	00808	00040	20004	516	
01886	XXM	0009F	00000	00808	00040	20004	516	
01886	XXT	0009F	00000	00808	00040	20004	516	
018ED	XXT	0009F	00000	00008	00040	20004	503	
01936	XXD	0009F	00000	00809	00040	20004	502	

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01936	XXD	0009F	00000	00809	00040	20004	510
01936	XXD	0009F	00000	00809	00040	20004	512
01936	XXD	0009F	00000	0080A	00040	20004	517
01936	XXM	0009F	00000	00809	00040	20004	502
01936	XXM	0009F	00000	00809	00040	20004	510
01936	XXM	0009F	00Q00	00809	00040	20004	512
01936	XXM	0009F	00000	0080A	00040	20004	517
01936	XXT	0009F	00000	00809	00040	20004	502
01936	XXT	0009F	00000	00809	00040	20004	510
01936	XXT	0009F	00000	00809	00040	20004	512
01936	XXT	0009F	00000	0080A	00040	20004	517
0193A	XXM	0009F	00000	00808	00040	20004	309
01956	XXD	0009F	00000	00809	00040	20004	507
01956	XXD	0009F	00000	00809	00040	20004	510
01956	XXM	0009F	00000	00809	00040	20004	251
01956	XXM	0009F	00000	00809	00040	20004	254
01956	XXM	0009F	00000	00809	00040	20004	507
01956	XXM	0009F	00000	00809	00040	20004	510
01956	XXT	0009F	00000	00809	00040	20004	507
01956	XXT	0009F	00000	00809	00040	20004	510
019A8	XXD	0009F	00000	00809	00040	20004	203
019A8	XXD	0009F	00000	00809	00040	20004	506
019A8	XXD	0009F	00000	00809	00040	20004	510
019A8	XXD	0009F	00000	00809	00040	20004	512
019A8	XXD	0009F	00000	0080A	00040	20004	517
019A8	XXD	0009F	00000	0C009	00040	20004	500
019A8	XXM	0009F	00000	00809	00040	20004	203
019A8	XXM	0009F	00000	00809	00040	20004	506
019A8	XXM	0009F	00000	00809	00040	20004	510
019A8	XXM	0009F	00000	00809	00040	20004	512
019A8	XXM	0009F	00000	0080A	00040	20004	517
019A8	XXM	0009F	00000	0C009	00040	20004	500
019A8	XXT	0009F	00000	00809	00040	20004	203
019A8	XXT	0009F	00000	00809	00040	20004	506
019A8	XXT	0009F	00000	00809	00040	20004	510
019A8	XXT	0009F	00000	00809	00040	20004	512

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
019A8	XXT	0009F	00000	0080A	00040	20004	517	
019A8	XXT	0009F	00000	0C009	00040	20004	500	
019AC	XXD	0009F	00000	00808	00040	00004	403	
019AC	XXD	0009F	00000	00808	00040	20004	403	
019AC	XXD	0009F	00000	00808	00040	20004	419	
019AC	XXM	0009F	00000	00808	00040	00004	403	
019AC	XXM	0009F	00000	00808	00040	20004	285	
019AC	XXM	0009F	00000	00808	00040	20004	403	
019AC	XXM	0009F	00000	00808	00040	20004	419	
019AC	XXT	0009F	00000	00808	00040	00004	403	
019AC	XXT	0009F	00000	00808	00040	20004	214	
019AC	XXT	0009F	00000	00808	00040	20004	403	
019AC	XXT	0009F	00000	00808	00040	20004	419	
019C6	XXM	0009F	00000	00809	00040	20004	246	
019C6	XXM	0009F	00000	00809	00040	20004	250	
019C6	XXM	0009F	00000	00809	00040	20004	251	
019D0	XXD	0009F	00000	00808	00040	00004	402	
019D0	XXM	0009F	00000	00808	00040	00004	402	
019D0	XXT	0009F	00000	00808	00040	00004	402	
01A1C	X D X	0009F	00000	00880	0000C	20044	608	
01A1C	X T X	0009F	00000	00880	0000C	20044	608	
01A7E	XXM	0009F	00000	00009	00040	00024	502	
01A8A	XXM	0009F	00000	00008	00040	20004	255	
01B4A	XXD	0009F	00000	00808	00040	20004	509	
01B4A	XXD	0009F	00000	00808	00040	20004	517	
01B4A	XXM	0009F	00000	00808	00040	20004	509	
01B4A	XXM	0009F	00000	00808	00040	20004	517	
01B4A	XXT	0009F	00000	00808	00040	20004	509	
01B4A	XXT	0009F	00000	00808	00040	20004	517	
01B7E	XXD	0009F	00000	0080A	00040	20004	508	
01B7E	XXM	0009F	00000	0080A	00040	20004	508	
01B7E	XXT	0009F	00000	0080A	00040	20004	508	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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01B82	XXD	0009F	00000	00808	00040	20004	516	
01B82	XXM	0009F	00000	00808	00040	20004	516	
01B82	XXT	0009F	00000	00808	00040	20004	516	
01B98	XXD	0009F	00000	00808	00040	20004	513	
01B98	XXM	0009F	00000	00808	00040	20004	513	
01B98	XXT	0009F	00000	00808	00040	20004	513	
01BB6	XXM	0009F	00000	0080A	00040	20004	250	
01BB6	XXM	0009F	00000	0080A	00040	20004	251	
01BD2	XXD	0009F	00000	00809	00040	20004	517	
01BD2	XXM	0009F	00000	00809	00040	20004	517	
01BD2	XXT	0009F	00000	00809	00040	20004	517	
01BE0	X D X	0009F	00000	00808	00040	20000	509	
01BE0	X D X	0009F	00000	00808	04000	00000	509	
01BE0	X D X	0009F	00000	0080C	00000	20000	406	
01BE0	X D X	0009F	00000	0080C	00000	20000	408	
01BE0	X D X	0009F	00000	0080C	00000	20000	418	
01BE0	X D X	0009F	00000	0080C	04000	20000	509	
01BE0	X D X	0809F	00000	0080C	00000	20000	402	
01BE0	X M X	0009F	00000	00808	00040	20000	509	
01BE0	X M X	0009F	00000	00808	04000	00000	509	
01BE0	X M X	0009F	00000	0080C	00000	20000	406	
01BE0	X M X	0009F	00000	0080C	00000	20000	408	
01BE0	X M X	0009F	00000	0080C	00000	20000	418	
01BE0	X M X	0009F	00000	0080C	04000	20000	509	
01BE0	X M X	0809F	00000	0080C	00000	20000	402	
01BE0	X T X	0009F	00000	00808	00040	20000	509	
01BE0	X T X	0009F	00000	00808	04000	00000	509	
01BE0	X T X	0009F	00000	0080C	00000	20000	406	
01BE0	X T X	0009F	00000	0080C	00000	20000	408	
01BE0	X T X	0009F	00000	0080C	00000	20000	418	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
01BE0	X	T	X	0009F	00000	0080C	04000	20000 509
01BE0	X	T	X	0809F	00000	0080C	00000	20000 402
01BE2	X	D	X	00000	00000	0080C	00000	20000 419
01BE2	X	D	X	0009F	00000	0080C	00000	20000 401
01BE2	X	D	X	0009F	00000	0080C	00000	20000 408
01BE2	X	D	X	0809F	00000	0080C	00000	20000 401
01BE2	X	D	X	0809F	00000	0080C	00000	20000 407
01BE2	X	D	X	0809F	00000	0080C	00000	20000 415
01BE2	X	D	X	0809F	00000	0080C	00000	20000 418
01BE2	X	M	X	00000	00000	0080C	00000	20000 419
01BE2	X	M	X	0009F	00000	0080C	00000	20000 401
01BE2	X	M	X	0009F	00000	0080C	00000	20000 408
01BE2	X	M	X	0809F	00000	0080C	00000	20000 401
01BE2	X	M	X	0809F	00000	0080C	00000	20000 407
01BE2	X	M	X	0809F	00000	0080C	00000	20000 415
01BE2	X	M	X	0809F	00000	0080C	00000	20000 418
01BE2	X	T	X	00000	00000	0080C	00000	20000 419
01BE2	X	T	X	0009F	00000	0080C	00000	20000 401
01BE2	X	T	X	0009F	00000	0080C	00000	20000 408
01BE2	X	T	X	0809F	00000	0080C	00000	20000 401
01BE2	X	T	X	0809F	00000	0080C	00000	20000 407
01BE2	X	T	X	0809F	00000	0080C	00000	20000 415
01BE2	X	T	X	0809F	00000	0080C	00000	20000 418
01C02	X	D	X	0009F	00000	00880	0000C	20040 608
01C02	X	T	X	0009F	00000	00880	0000C	20040 608
01C02	XXD			0009F	00000	0080A	00040	20004 503
01C02	XXD			0009F	00000	0080A	00040	20004 507
01C02	XXM			0009F	00000	0080A	00040	20004 503
01C02	XXM			0009F	00000	0080A	00040	20004 507
01C02	XXT			0009F	00000	0080A	00040	20004 503
01C02	XXT			0009F	00000	0080A	00040	20004 507
01C04	XXD			0009F	00000	0080A	00040	20004 417
01C04	XXM			0009F	00000	00809	00040	20004 286
01C04	XXM			0009F	00000	0080A	00040	20004 292
01C04	XXM			0009F	00000	0080A	00040	20004 417

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01C04	XXT	0009F	00000	0080A	00040	20004	417
01C08	XXD	0009F	00000	00808	00040	00004	402
01C08	XXD	0009F	00000	00808	00040	00004	414
01C08	XXD	0009F	00000	00808	00040	20004	203
01C08	XXD	0009F	00000	00808	00040	20004	210
01C08	XXD	0009F	00000	00808	00040	20004	213
01C08	XXD	0009F	00000	00808	00040	20004	401
01C08	XXD	0009F	00000	00808	00040	20004	407
01C08	XXD	0009F	00000	00808	00040	20004	410
01C08	XXD	0009F	00000	00808	00040	20004	413
01C08	XXD	0009F	00000	00808	00040	20004	416
01C08	XXD	0009F	00000	00808	00040	20004	417
01C08	XXD	0009F	00000	00808	00040	20004	508
01C08	XXD	0009F	00000	00808	00040	20004	515
01C08	XXD	0009F	00000	00809	00040	20004	401
01C08	XXD	0009F	00010	00808	00040	20004	409
01C08	XXD	1009F	00000	00808	00040	20004	410
01C08	XXM	0009F	00000	00808	00040	00004	402
01C08	XXM	0009F	00000	00808	00040	00004	414
01C08	XXM	0009F	00000	00808	00040	20000	402
01C08	XXM	0009F	00000	00808	00040	20004	203
01C08	XXM	0009F	00000	00808	00040	20004	210
01C08	XXM	0009F	00000	00808	00040	20004	213
01C08	XXM	0009F	00000	00808	00040	20004	216
01C08	XXM	0009F	00000	00808	00040	20004	226
01C08	XXM	0009F	00000	00808	00040	20004	313
01C08	XXM	0009F	00000	00808	00040	20004	401
01C08	XXM	0009F	00000	00808	00040	20004	407
01C08	XXM	0009F	00000	00808	00040	20004	410
01C08	XXM	0009F	00000	00808	00040	20004	413
01C08	XXM	0009F	00000	00808	00040	20004	416
01C08	XXM	0009F	00000	00808	00040	20004	417
01C08	XXM	0009F	00000	00808	00040	20004	508
01C08	XXM	0009F	00000	00808	00040	20004	515
01C08	XXM	0009F	00000	00808	00040	24004	162
01C08	XXM	0009F	00000	00809	00040	20004	401
01C08	XXM	0009F	00010	00808	00040	20004	409
01C08	XXM	1009F	00000	00808	00040	20004	410
01C08	XXT	0009F	00000	00808	00040	00004	402
01C08	XXT	0009F	00000	00808	00040	00004	414

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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01C08	XXT	0009F	00000	00808	00040	20004	203	
01C08	XXT	0009F	00000	00808	00040	20004	210	
01C08	XXT	0009F	00000	00808	00040	20004	213	
01C08	XXT	0009F	00000	00808	00040	20004	401	
01C08	XXT	0009F	00000	00808	00040	20004	407	
01C08	XXT	0009F	00000	00808	00040	20004	410	
01C08	XXT	0009F	00000	00808	00040	20004	413	
01C08	XXT	0009F	00000	00808	00040	20004	416	
01C08	XXT	0009F	00000	00808	00040	20004	417	
01C08	XXT	0009F	00000	00808	00040	20004	508	
01C08	XXT	0009F	00000	00808	00040	20004	515	
01C08	XXT	0009F	00000	00809	00040	20004	401	
01C08	XXT	0009F	00010	00808	00040	20004	409	
01C08	XXT	1009F	00000	00808	00040	20004	410	
01C28	XXD	0009F	00000	00808	00040	20004	414	
01C28	XXD	0009F	00000	00809	00040	20004	404	
01C28	XXD	0009F	00000	0080A	00040	20004	414	
01C28	XXD	0009F	00000	0080A	00040	20004	417	
01C28	XXM	0009F	00000	00808	00040	20004	414	
01C28	XXM	0009F	00000	00809	00040	20004	404	
01C28	XXM	0009F	00000	0080A	00040	20004	246	
01C28	XXM	0009F	00000	0080A	00040	20004	414	
01C28	XXM	0009F	00000	0080A	00040	20004	417	
01C28	XXT	0009F	00000	00808	00040	20004	414	
01C28	XXT	0009F	00000	00809	00040	20004	404	
01C28	XXT	0009F	00000	0080A	00040	20004	414	
01C28	XXT	0009F	00000	0080A	00040	20004	417	
01C3E	XXD	0009F	00000	00809	00040	20004	402	
01C3E	XXD	0009F	00000	00809	00040	20004	406	
01C3E	XXD	0009F	00000	00809	00040	20004	414	
01C3E	XXD	0009F	00000	0080A	00040	20004	403	
01C3E	XXM	0009F	00000	00809	00040	20004	402	
01C3E	XXM	0009F	00000	00809	00040	20004	406	
01C3E	XXM	0009F	00000	00809	00040	20004	414	
01C3E	XXM	0009F	00000	0080A	00040	20004	285	
01C3E	XXM	0009F	00000	0080A	00040	20004	403	

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01C3E	XXT	0009F	00000	00809	00040	20004	402
01C3E	XXT	0009F	00000	00809	00040	20004	406
01C3E	XXT	0009F	00000	00809	00040	20004	414
01C3E	XXT	0009F	00000	0080A	00040	20004	403
01C5E	XXD	0009F	00000	00809	00040	20004	414
01C5E	XXD	0009F	00000	0080A	00040	20004	403
01C5E	XXD	0009F	00000	0080A	00040	20004	414
01C5E	XXM	0009F	00000	00809	00040	20004	414
01C5E	XXM	0009F	00000	0080A	00040	20004	285
01C5E	XXM	0009F	00000	0080A	00040	20004	403
01C5E	XXM	0009F	00000	0080A	00040	20004	414
01C5E	XXT	0009F	00000	00809	00040	20004	414
01C5E	XXT	0009F	00000	0080A	00040	20004	403
01C5E	XXT	0009F	00000	0080A	00040	20004	414
01C9C	XXD	0009F	00000	00809	00040	20004	203
01C9C	XXD	0009F	00000	00809	00040	20004	214
01C9C	XXD	0009F	00000	00809	00040	20004	407
01C9C	XXD	0009F	00000	00809	00040	20004	414
01C9C	XXD	0009F	00000	0080A	00040	20004	406
01C9C	XXM	0009F	00000	00809	00040	20004	203
01C9C	XXM	0009F	00000	00809	00040	20004	214
01C9C	XXM	0009F	00000	00809	00040	20004	407
01C9C	XXM	0009F	00000	00809	00040	20004	414
01C9C	XXM	0009F	00000	0080A	00040	20004	406
01C9C	XXT	0009F	00000	00809	00040	20004	203
01C9C	XXT	0009F	00000	00809	00040	20004	214
01C9C	XXT	0009F	00000	00809	00040	20004	407
01C9C	XXT	0009F	00000	00809	00040	20004	414
01C9C	XXT	0009F	00000	0080A	00040	20004	406
01CD6	XXD	0009F	00000	0080A	00040	20004	401
01CD6	XXM	0009F	00000	0080A	00040	20004	401
01CD6	XXT	0009F	00000	0080A	00040	20004	401
01CFC	XXD	0009F	00000	00809	00040	20004	404
01CFC	XXD	0009F	00000	00809	00040	20004	405
01CFC	XXD	0009F	00000	0080A	00040	20004	404

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
01CFC	XXM	0009F	00000	00809	00040	20004	254	
01CFC	XXM	0009F	00000	00809	00040	20004	289	
01CFC	XXM	0009F	00000	00809	00040	20004	290	
01CFC	XXM	0009F	00000	00809	00040	20004	404	
01CFC	XXM	0009F	00000	00809	00040	20004	405	
01CFC	XXM	0009F	00000	0080A	00040	20004	289	
01CFC	XXM	0009F	00000	0080A	00040	20004	404	
01CFC	XXT	0009F	00000	00809	00040	20004	404	
01CFC	XXT	0009F	00000	00809	00040	20004	405	
01CFC	XXT	0009F	00000	0080A	00040	20004	404	
01DOA	XXD	0009F	00000	00809	00040	20004	411	
01DOA	XXD	0009F	00000	00809	00040	20004	416	
01DOA	XXD	0009F	00000	00809	00040	20004	419	
01DOA	XXD	0009F	00000	00809	00040	20004	509	
01DOA	XXD	0009F	00000	00809	00040	20004	513	
01DOA	XXD	0009F	00000	0080A	00040	20004	405	
01DOA	XXD	0009F	00000	0080A	00040	20004	417	
01DOA	XXD	0409F	00000	0080A	00040	20004	411	
01DOA	XXD	3409F	00000	00809	00040	20004	418	
01DOA	XXM	0009F	00000	00809	00040	20004	411	
01DOA	XXM	0009F	00000	00809	00040	20004	416	
01DOA	XXM	0009F	00000	00809	00040	20004	419	
01DOA	XXM	0009F	00000	00809	00040	20004	509	
01DOA	XXM	0009F	00000	00809	00040	20004	513	
01DOA	XXM	0009F	00000	0080A	00040	20004	405	
01DOA	XXM	0009F	00000	0080A	00040	20004	417	
01DOA	XXM	0409F	00000	0080A	00040	20004	411	
01DOA	XXM	3409F	00000	00809	00040	20004	418	
01DOA	XXT	0009F	00000	00809	00040	20004	411	
01DOA	XXT	0009F	00000	00809	00040	20004	416	
01DOA	XXT	0009F	00000	00809	00040	20004	419	
01DOA	XXT	0009F	00000	00809	00040	20004	509	
01DOA	XXT	0009F	00000	00809	00040	20004	513	
01DOA	XXT	0009F	00000	0080A	00040	20004	405	
01DOA	XXT	0009F	00000	0080A	00040	20004	417	
01DOA	XXT	0409F	00000	0080A	00040	20004	411	
01DOA	XXT	3409F	00000	00809	00040	20004	418	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
01D18	X D X	0009F	00000	00880	0000C	20044	608	
01D18	X T X	0009F	00000	00880	0000C	20044	608	
01D18	XXD	0009F	00000	00808	00040	20004	406	
01D18	XXD	0009F	00000	00808	00040	20004	411	
01D18	XXD	0009F	00000	00808	00040	20004	415	
01D18	XXD	0009F	00000	00808	00040	20004	416	
01D18	XXD	0009F	00000	00808	00040	20004	417	
01D18	XXM	0009F	00000	00808	00040	20004	406	
01D18	XXM	0009F	00000	00808	00040	20004	411	
01D18	XXM	0009F	00000	00808	00040	20004	415	
01D18	XXM	0009F	00000	00808	00040	20004	416	
01D18	XXM	0009F	00000	00808	00040	20004	417	
01D18	XXT	0009F	00000	00808	00040	20004	406	
01D18	XXT	0009F	00000	00808	00040	20004	411	
01D18	XXT	0009F	00000	00808	00040	20004	415	
01D18	XXT	0009F	00000	00808	00040	20004	416	
01D18	XXT	0009F	00000	00808	00040	20004	417	
01D1C	XXD		00000	00808	00040	20004	608	
01D1C	XXT		00000	00808	00040	20004	608	
01D30	XXD	0009F	00000	00808	00040	20004	406	
01D30	XXD	0009F	00000	00808	00040	20004	416	
01D30	XXD	0009F	00000	00808	00040	20004	512	
01D30	XXD	0009F	00000	0080A	00040	20004	410	
01D30	XXD	0009F	00000	0080A	00040	20004	416	
01D30	XXD	0009F	00000	0080A	00040	20004	418	
01D30	XXD	0009F	00000	0080B	00040	20004	406	
01D30	XXM	0009F	00000	00808	00040	20004	406	
01D30	XXM	0009F	00000	00808	00040	20004	416	
01D30	XXM	0009F	00000	00808	00040	20004	512	
01D30	XXM	0009F	00000	0080A	00040	20004	410	
01D30	XXM	0009F	00000	0080A	00040	20004	416	
01D30	XXM	0009F	00000	0080A	00040	20004	418	
01D30	XXM	0009F	00000	0080B	00040	20004	406	
01D30	XXT	0009F	00000	00808	00040	20004	406	
01D30	XXT	0009F	00000	00808	00040	20004	416	
01D30	XXT	0009F	00000	00808	00040	20004	512	
01D30	XXT	0009F	00000	0080A	00040	20004	410	
01D30	XXT	0009F	00000	0080A	00040	20004	416	
01D30	XXT	0009F	00000	0080A	00040	20004	418	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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01D30	XXT	0009F	00000	0080B	00040	20004	406	
01D3E	XXD	0009F	00000	00808	00040	20004	406	
01D3E	XXD	0009F	00000	00808	00040	20004	411	
01D3E	XXD	0009F	00000	00809	00040	20004	410	
01D3E	XXD	0009F	00000	00809	00040	20004	416	
01D3E	XXD	0009F	00000	00809	00040	20004	418	
01D3E	XXD	0009F	00000	0080B	00040	20004	406	
01D3E	XXD	0009F	00000	0080B	00040	20004	415	
01D3E	XXD	2009F	00000	00809	00040	20004	410	
01D3E	XXM	0009F	00000	00808	00040	20004	406	
01D3E	XXM	0009F	00000	00808	00040	20004	411	
01D3E	XXM	0009F	00000	00809	00040	20004	410	
01D3E	XXM	0009F	00000	00809	00040	20004	416	
01D3E	XXM	0009F	00000	00809	00040	20004	418	
01D3E	XXM	0009F	00000	0080B	00040	20004	295	
01D3E	XXM	0009F	00000	0080B	00040	20004	406	
01D3E	XXM	0009F	00000	0080B	00040	20004	415	
01D3E	XXM	2009F	00000	00809	00040	20004	410	
01D3E	XXT	0009F	00000	00808	00040	20004	406	
01D3E	XXT	0009F	00000	00808	00040	20004	411	
01D3E	XXT	0009F	00000	00809	00040	20004	410	
01D3E	XXT	0009F	00000	00809	00040	20004	416	
01D3E	XXT	0009F	00000	00809	00040	20004	418	
01D3E	XXT	0009F	00000	0080B	00040	20004	406	
01D3E	XXT	0009F	00000	0080B	00040	20004	415	
01D3E	XXT	2009F	00000	00809	00040	20004	410	
01D50	XXD		00000	00808	00040	20004	608	
01D50	XXD	0009F	00000	00808	00040	20004	407	
01D50	XXD	0009F	00000	00808	00040	20004	417	
01D50	XXD	0009F	00000	00808	00040	20004	504	
01D50	XXM	0009F	00000	00808	00040	20004	407	
01D50	XXM	0009F	00000	00808	00040	20004	417	
01D50	XXM	0009F	00000	00808	00040	20004	504	
01D50	XXT		00000	00808	00040	20004	608	
01D50	XXT	0009F	00000	00808	00040	20004	407	
01D50	XXT	0009F	00000	00808	00040	20004	417	

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01D50	XXT	0009F	00000	00808	00040	20004	504
01D84	XXM	0009F	00000	00008	00040	20004	505
01D84	XXM	0009F	00000	00809	00040	20004	216
01D84	XXT	0009F	00000	00008	00040	20004	505
01D88	XXD	0009F	00000	00808	00040	20004	403
01D88	XXD	0009F	00000	00808	00040	20004	406
01D88	XXD	0009F	00000	00808	00040	20004	407
01D88	XXD	0009F	00000	00808	00040	20004	414
01D88	XXD	0009F	00000	00808	00040	20004	416
01D88	XXD	0009F	00000	00808	00040	20004	417
01D88	XXM	0009F	00000	00808	00040	20004	288
01D88	XXM	0009F	00000	00808	00040	20004	403
01D88	XXM	0009F	00000	00808	00040	20004	406
01D88	XXM	0009F	00000	00808	00040	20004	407
01D88	XXM	0009F	00000	00808	00040	20004	414
01D88	XXM	0009F	00000	00808	00040	20004	416
01D88	XXM	0009F	00000	00808	00040	20004	417
01D88	XXT	0009F	00000	00808	00040	20004	403
01D88	XXT	0009F	00000	00808	00040	20004	406
01D88	XXT	0009F	00000	00808	00040	20004	407
01D88	XXT	0009F	00000	00808	00040	20004	414
01D88	XXT	0009F	00000	00808	00040	20004	416
01D88	XXT	0009F	00000	00808	00040	20004	417
01D8C	XXD	0009F	00000	00808	00040	20004	215
01D8C	XXD	0009F	00000	00808	00040	20004	404
01D8C	XXD	0009F	00000	00808	00040	20004	414
01D8C	XXD	0009F	00000	00808	00040	20004	415
01D8C	XXD	0009F	00000	00808	00040	20004	417
01D8C	XXM	0009F	00000	00808	00040	20004	204
01D8C	XXM	0009F	00000	00808	00040	20004	215
01D8C	XXM	0009F	00000	00808	00040	20004	216
01D8C	XXM	0009F	00000	00808	00040	20004	288
01D8C	XXM	0009F	00000	00808	00040	20004	313
01D8C	XXM	0009F	00000	00808	00040	20004	404
01D8C	XXM	0009F	00000	00808	00040	20004	414
01D8C	XXM	0009F	00000	00808	00040	20004	415
01D8C	XXM	0009F	00000	00808	00040	20004	417
01D8C	XXT	0009F	00000	00808	00040	20004	215
01D8C	XXT	0009F	00000	00808	00040	20004	404
01D8C	XXT	0009F	00000	00808	00040	20004	414
01D8C	XXT	0009F	00000	00808	00040	20004	415
01D8C	XXT	0009F	00000	00808	00040	20004	417
01D90	XXD	0009F	00000	00808	00040	00004	402

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01D90	XXD	0009F	00000	00808	00040	20004	213
01D90	XXD	0009F	00000	00808	00040	20004	401
01D90	XXD	0009F	00000	00808	00040	20004	402
01D90	XXD	0009F	00000	00808	00040	20004	403
01D90	XXD	0009F	00000	00808	00040	20004	404
01D90	XXD	0009F	00000	00808	00040	20004	405
01D90	XXD	0009F	00000	00808	00040	20004	406
01D90	XXD	0009F	00000	00808	00040	20004	413
01D90	XXD	0009F	00000	00808	00040	20004	414
01D90	XXD	0009F	00000	00808	00040	20004	415
01D90	XXD	0009F	00000	00808	00040	20004	416
01D90	XXD	0009F	00000	00808	00040	20004	417
01D90	XXD	0009F	00000	00808	00040	20004	419
01D90	XXD	0009F	00000	00808	00040	20004	512
01D90	XXD	0009F	00000	00809	00040	20004	407
01D90	XXD	0009F	00000	0080A	00040	20004	414
01D90	XXM	0009F	00000	00808	00040	00004	402
01D90	XXM	0009F	00000	00808	00040	20004	213
01D90	XXM	0009F	00000	00808	00040	20004	216
01D90	XXM	0009F	00000	00808	00040	20004	401
01D90	XXM	0009F	00000	00808	00040	20004	402
01D90	XXM	0009F	00000	00808	00040	20004	403
01D90	XXM	0009F	00000	00808	00040	20004	404
01D90	XXM	0009F	00000	00808	00040	20004	405
01D90	XXM	0009F	00000	00808	00040	20004	406
01D90	XXM	0009F	00000	00808	00040	20004	413
01D90	XXM	0009F	00000	00808	00040	20004	414
01D90	XXM	0009F	00000	00808	00040	20004	415
01D90	XXM	0009F	00000	00808	00040	20004	416
01D90	XXM	0009F	00000	00808	00040	20004	417
01D90	XXM	0009F	00000	00808	00040	20004	419
01D90	XXM	0009F	00000	00808	00040	20004	512
01D90	XXM	0009F	00000	00809	00040	20004	407
01D90	XXM	0009F	00000	0080A	00040	20004	414
01D90	XXT	0009F	00000	00808	00040	00004	402
01D90	XXT	0009F	00000	00808	00040	20004	213
01D90	XXT	0009F	00000	00808	00040	20004	401
01D90	XXT	0009F	00000	00808	00040	20004	402
01D90	XXT	0009F	00000	00808	00040	20004	403
01D90	XXT	0009F	00000	00808	00040	20004	404
01D90	XXT	0009F	00000	00808	00040	20004	405
01D90	XXT	0009F	00000	00808	00040	20004	406
01D90	XXT	0009F	00000	00808	00040	20004	413
01D90	XXT	0009F	00000	00808	00040	20004	414
01D90	XXT	0009F	00000	00808	00040	20004	415

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01D90	XXT	0009F	00000	00808	00040	20004	416
01D90	XXT	0009F	00000	00808	00040	20004	417
01D90	XXT	0009F	00000	00808	00040	20004	419
01D90	XXT	0009F	00000	00808	00040	20004	512
01D90	XXT	0009F	00000	00809	00040	20004	407
01D90	XXT	0009F	00000	0080A	00040	20004	414
01DB8	XXD	0009F	00000	00808	00040	20004	203
01DB8	XXD	0009F	00000	00809	00040	20004	404
01DB8	XXD	0009F	00000	00809	00040	20004	405
01DB8	XXD	0009F	00000	00809	00040	20004	407
01DB8	XXD	0009F	00000	00809	00040	20004	411
01DB8	XXD	0009F	00000	00809	00040	20004	416
01DB8	XXD	0009F	00000	0080A	00040	20004	411
01DB8	XXD	0009F	00000	0080A	00040	20004	415
01DB8	XXD	0009F	00000	0080A	00040	20004	416
01DB8	XXM	0009F	00000	00808	00040	20004	203
01DB8	XXM	0009F	00000	00809	00040	20004	153
01DB8	XXM	0009F	00000	00809	00040	20004	254
01DB8	XXM	0009F	00000	00809	00040	20004	404
01DB8	XXM	0009F	00000	00809	00040	20004	405
01DB8	XXM	0009F	00000	00809	00040	20004	407
01DB8	XXM	0009F	00000	00809	00040	20004	411
01DB8	XXM	0009F	00000	00809	00040	20004	416
01DB8	XXM	0009F	00000	0080A	00040	20004	241
01DB8	XXM	0009F	00000	0080A	00040	20004	411
01DB8	XXM	0009F	00000	0080A	00040	20004	415
01DB8	XXM	0009F	00000	0080A	00040	20004	416
01DB8	XXM	0029F	00000	00809	00040	20004	407
01DB8	XXT	0009F	00000	00808	00040	20004	203
01DB8	XXT	0009F	00000	00809	00040	20004	404
01DB8	XXT	0009F	00000	00809	00040	20004	405
01DB8	XXT	0009F	00000	00809	00040	20004	407
01DB8	XXT	0009F	00000	00809	00040	20004	411
01DB8	XXT	0009F	00000	00809	00040	20004	416
01DB8	XXT	0009F	00000	0080A	00040	20004	411
01DB8	XXT	0009F	00000	0080A	00040	20004	415
01DB8	XXT	0009F	00000	0080A	00040	20004	416
01DB8	XXT	0009F	00000	3480B	00041	00020	507
01DB8	XXT	0029F	00000	00809	00040	20004	407

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01DC6	XXD	0009F	00000	00808	00040	20004	411
01DC6	XXD	0009F	00000	00808	00040	20004	416
01DC6	XXD	0009F	00000	00808	00040	20004	417
01DC6	XXD	0009F	00000	00808	00040	20004	419
01DC6	XXD	0009F	00000	0080B	00040	20004	406
01DC6	XXM	0009F	00000	00808	00040	20004	411
01DC6	XXM	0009F	00000	00808	00040	20004	416
01DC6	XXM	0009F	00000	00808	00040	20004	417
01DC6	XXM	0009F	00000	00808	00040	20004	419
01DC6	XXM	0009F	00000	0080B	00040	20004	406
01DC6	XXT	0009F	00000	00808	00040	20004	411
01DC6	XXT	0009F	00000	00808	00040	20004	416
01DC6	XXT	0009F	00000	00808	00040	20004	417
01DC6	XXT	0009F	00000	00808	00040	20004	419
01DC6	XXT	0009F	00000	0080B	00040	20004	406
01DD4	XXD	0009F	00000	00808	00040	20004	404
01DD4	XXD	0009F	00000	00808	00040	20004	412
01DD4	XXD	0009F	00000	00808	00040	20004	414
01DD4	XXD	0009F	00000	00809	00040	20004	412
01DD4	XXD	0009F	00000	00809	00040	20004	418
01DD4	XXD	0009F	00000	00809	10040	20004	412
01DD4	XXM	0009F	00000	00808	00040	20004	404
01DD4	XXM	0009F	00000	00808	00040	20004	412
01DD4	XXM	0009F	00000	00808	00040	20004	414
01DD4	XXM	0009F	00000	00809	00040	20004	254
01DD4	XXM	0009F	00000	00809	00040	20004	412
01DD4	XXM	0009F	00000	00809	00040	20004	418
01DD4	XXM	0009F	00000	00809	10040	20004	412
01DD4	XXT	0009F	00000	00808	00040	20004	404
01DD4	XXT	0009F	00000	00808	00040	20004	412
01DD4	XXT	0009F	00000	00808	00040	20004	414
01DD4	XXT	0009F	00000	00809	00040	20004	412
01DD4	XXT	0009F	00000	00809	00040	20004	418
01DD4	XXT	0009F	00000	00809	10040	20004	412
01DE0	X M X	0009F	00000	0080C	00000	20000	153
01E1C	XXD	0009F	00000	0C00A	00040	20004	608

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01E1C	XXT	0009F	00000	0C00A	00040	20004	608
01E20	XXD	0009F	00000	00808	00040	00004	402
01E20	XXD	0009F	00000	00808	00040	00004	414
01E20	XXD	0009F	00000	00808	00040	20004	214
01E20	XXD	0009F	00000	00808	00040	20004	401
01E20	XXD	0009F	00000	00808	00040	20004	402
01E20	XXD	0009F	00000	00808	00040	20004	403
01E20	XXD	0009F	00000	00808	00040	20004	404
01E20	XXD	0009F	00000	00808	00040	20004	405
01E20	XXD	0009F	00000	00808	00040	20004	406
01E20	XXD	0009F	00000	00808	00040	20004	407
01E20	XXD	0009F	00000	00808	00040	20004	410
01E20	XXD	0009F	00000	00808	00040	20004	411
01E20	XXD	0009F	00000	00808	00040	20004	412
01E20	XXD	0009F	00000	00808	00040	20004	413
01E20	XXD	0009F	00000	00808	00040	20004	414
01E20	XXD	0009F	00000	00808	00040	20004	415
01E20	XXD	0009F	00000	00808	00040	20004	416
01E20	XXD	0009F	00000	00808	00040	20004	417
01E20	XXD	0009F	00000	00808	00040	20004	418
01E20	XXD	0009F	00000	00809	00040	20004	405
01E20	XXD	0049F	00000	00808	00040	20004	412
01E20	XXD	0109F	00000	00808	00040	20004	412
01E20	XXM	0009F	00000	00808	00040	00004	402
01E20	XXM	0009F	00000	00808	00040	00004	414
01E20	XXM	0009F	00000	00808	00040	20004	204
01E20	XXM	0009F	00000	00808	00040	20004	214
01E20	XXM	0009F	00000	00808	00040	20004	226
01E20	XXM	0009F	00000	00808	00040	20004	239
01E20	XXM	0009F	00000	00808	00040	20004	240
01E20	XXM	0009F	00000	00808	00040	20004	241
01E20	XXM	0009F	00000	00808	00040	20004	242
01E20	XXM	0009F	00000	00808	00040	20004	249
01E20	XXM	0009F	00000	00808	00040	20004	252
01E20	XXM	0009F	00000	00808	00040	20004	253
01E20	XXM	0009F	00000	00808	00040	20004	254
01E20	XXM	0009F	00000	00808	00040	20004	288
01E20	XXM	0009F	00000	00808	00040	20004	289
01E20	XXM	0009F	00000	00808	00040	20004	290
01E20	XXM	0009F	00000	00808	00040	20004	291
01E20	XXM	0009F	00000	00808	00040	20004	401
01E20	XXM	0009F	00000	00808	00040	20004	402
01E20	XXM	0009F	00000	00808	00040	20004	403
01E20	XXM	0009F	00000	00808	00040	20004	404
01E20	XXM	0009F	00000	00808	00040	20004	405
01E20	XXM	0009F	00000	00808	00040	20004	406

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01E20	XXM	0009F	00000	00808	00040	20004	407
01E20	XXM	0009F	00000	00808	00040	20004	410
01E20	XXM	0009F	00000	00808	00040	20004	411
01E20	XXM	0009F	00000	00808	00040	20004	412
01E20	XXM	0009F	00000	00808	00040	20004	413
01E20	XXM	0009F	00000	00808	00040	20004	414
01E20	XXM	0009F	00000	00808	00040	20004	415
01E20	XXM	0009F	00000	00808	00040	20004	416
01E20	XXM	0009F	00000	00808	00040	20004	417
01E20	XXM	0009F	00000	00808	00040	20004	418
01E20	XXM	0009F	00000	00809	00040	20004	405
01E20	XXM	0049F	00000	00808	00040	20004	412
01E20	XXM	0109F	00000	00808	00040	20004	412
01E20	XXT	0009F	00000	00808	00040	00004	402
01E20	XXT	0009F	00000	00808	00040	00004	414
01E20	XXT	0009F	00000	00808	00040	20004	214
01E20	XXT	0009F	00000	00808	00040	20004	401
01E20	XXT	0009F	00000	00808	00040	20004	402
01E20	XXT	0009F	00000	00808	00040	20004	403
01E20	XXT	0009F	00000	00808	00040	20004	404
01E20	XXT	0009F	00000	00808	00040	20004	405
01E20	XXT	0009F	00000	00808	00040	20004	406
01E20	XXT	0009F	00000	00808	00040	20004	407
01E20	XXT	0009F	00000	00808	00040	20004	410
01E20	XXT	0009F	00000	00808	00040	20004	411
01E20	XXT	0009F	00000	00808	00040	20004	412
01E20	XXT	0009F	00000	00808	00040	20004	413
01E20	XXT	0009F	00000	00808	00040	20004	414
01E20	XXT	0009F	00000	00808	00040	20004	415
01E20	XXT	0009F	00000	00808	00040	20004	416
01E20	XXT	0009F	00000	00808	00040	20004	417
01E20	XXT	0009F	00000	00808	00040	20004	418
01E20	XXT	0009F	00000	00809	00040	20004	405
01E20	XXT	0049F	00000	00808	00040	20004	412
01E20	XXT	0109F	00000	00808	00040	20004	412
01E4A	XXD	0009F	00000	0080A	00040	20004	407
01E4A	XXD	0009F	00000	0080A	00040	20004	416
01E4A	XXD	0009F	00000	0080A	00040	20004	418
01E4A	XXM	0009F	00000	0080A	00040	20004	291
01E4A	XXM	0009F	00000	0080A	00040	20004	407
01E4A	XXM	0009F	00000	0080A	00040	20004	416
01E4A	XXM	0009F	00000	0080A	00040	20004	418

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01E4A	XXT	0009F	00000	0080A	00040	20004	407
01E4A	XXT	0009F	00000	0080A	00040	20004	416
01E4A	XXT	0009F	00000	0080A	00040	20004	418
01E98	XXM	0009F	00000	00808	00040	20004	416
01E9A	XXD	0009F	00000	00808	00040	20004	406
01E9A	XXD	0009F	00000	00808	00040	20004	407
01E9A	XXD	0009F	00000	00808	00040	20004	415
01E9A	XXD	0009F	00000	00808	00040	20004	416
01E9A	XXD	0009F	00000	00808	00040	20004	512
01E9A	XXM	0009F	00000	00808	00040	20004	252
01E9A	XXM	0009F	00000	00808	00040	20004	253
01E9A	XXM	0009F	00000	00808	00040	20004	255
01E9A	XXM	0009F	00000	00808	00040	20004	290
01E9A	XXM	0009F	00000	00808	00040	20004	406
01E9A	XXM	0009F	00000	00808	00040	20004	407
01E9A	XXM	0009F	00000	00808	00040	20004	415
01E9A	XXM	0009F	00000	00808	00040	20004	416
01E9A	XXM	0009F	00000	00808	00040	20004	512
01E9A	XXT	0009F	00000	00808	00040	20004	406
01E9A	XXT	0009F	00000	00808	00040	20004	407
01E9A	XXT	0009F	00000	00808	00040	20004	415
01E9A	XXT	0009F	00000	00808	00040	20004	416
01E9A	XXT	0009F	00000	00808	00040	20004	512
01ECC	XXD	0009F	00000	00808	00040	20004	401
01ECC	XXD	0009F	00000	00808	00040	20004	403
01ECC	XXD	0009F	00000	00808	00040	20004	404
01ECC	XXD	0009F	00000	00808	00040	20004	405
01ECC	XXD	0009F	00000	00808	00040	20004	407
01ECC	XXD	0009F	00000	00808	00040	20004	411
01ECC	XXD	0009F	00000	00808	00040	20004	412
01ECC	XXD	0009F	00000	00808	00040	20004	414
01ECC	XXD	0009F	00000	00808	00040	20004	415
01ECC	XXD	0009F	00000	00808	00040	20004	417
01ECC	XXD	0089F	00000	00808	00040	20004	412
01ECC	XXM	0009F	00000	00808	00040	20004	226
01ECC	XXM	0009F	00000	00808	00040	20004	248
01ECC	XXM	0009F	00000	00808	00040	20004	249
01ECC	XXM	0009F	00000	00808	00040	20004	254
01ECC	XXM	0009F	00000	00808	00040	20004	289
01ECC	XXM	0009F	00000	00808	00040	20004	290
01ECC	XXM	0009F	00000	00808	00040	20004	291
01ECC	XXM	0009F	00000	00808	00040	20004	401
01ECC	XXM	0009F	00000	00808	00040	20004	403
01ECC	XXM	0009F	00000	00808	00040	20004	404
01ECC	XXM	0009F	00000	00808	00040	20004	405
01ECC	XXM	0009F	00000	00808	00040	20004	407

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
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01ECC	XXM	0009F	00000	00808	00040	20004	411
01ECC	XXM	0009F	00000	00808	00040	20004	412
01ECC	XXM	0009F	00000	00808	00040	20004	414
01ECC	XXM	0009F	00000	00808	00040	20004	415
01ECC	XXM	0009F	00000	00808	00040	20004	417

01ECC	XXM	0089F	00000	00808	00040	20004	412
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01ECC	XXT	0009F	00000	00808	00040	20004	401
01ECC	XXT	0009F	00000	00808	00040	20004	403
01ECC	XXT	0009F	00000	00808	00040	20004	404
01ECC	XXT	0009F	00000	00808	00040	20004	405
01ECC	XXT	0009F	00000	00808	00040	20004	407
01ECC	XXT	0009F	00000	00808	00040	20004	411
01ECC	XXT	0009F	00000	00808	00040	20004	412
01ECC	XXT	0009F	00000	00808	00040	20004	414
01ECC	XXT	0009F	00000	00808	00040	20004	415
01ECC	XXT	0009F	00000	00808	00040	20004	417

01ECC	XXT	0089F	00000	00808	00040	20004	412
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01EDC	XXD	0009F	00000	0080A	00040	20004	416
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01EDC	XXM	0009F	00000	0080A	00040	20004	416
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01EDC	XXT	0009F	00000	0080A	00040	20004	416
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01EFA	XXD	0009F	00000	0080A	00040	20004	406
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01EFA	XXD	0009F	00000	0080A	00040	20004	410
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01EFA	XXD	0009F	00000	0080A	00040	20004	413
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01EFA	XXM	0009F	00000	00809	00040	20004	252
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01EFA	XXM	0009F	00000	0080A	00040	20004	216
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01EFA	XXM	0009F	00000	0080A	00040	20004	406
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01EFA	XXM	0009F	00000	0080A	00040	20004	410
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01EFA	XXM	0009F	00000	0080A	00040	20004	413
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01EFA	XXT	0009F	00000	0080A	00040	20004	406
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01EFA	XXT	0009F	00000	0080A	00040	20004	410
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01EFA	XXT	0009F	00000	0080A	00040	20004	413
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01F0E	XXD	0009F	00000	00809	00040	20004	416
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01F0E	XXM	0009F	00000	00809	00040	20004	416
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01F0E	XXT	0009F	00000	00809	00040	20004	416
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01F20	XXT	0009F	00000	00808	00040	20004	411
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01F2A	XXM	Q009F	00000	0080A	00040	20004	204
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01F3C	XXD	0009F	00000	00808	00040	20004	401
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D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
01F3C	XXD	0009F	00000	00808	00040	20004	406
01F3C	XXD	0009F	00000	00808	00040	20004	412
01F3C	XXM	0009F	00000	00808	00040	20004	204
01F3C	XXM	0009F	00000	00808	00040	20004	254
01F3C	XXM	0009F	00000	00808	00040	20004	401
01F3C	XXM	0009F	00000	00808	00040	20004	406
01F3C	XXM	0009F	00000	00808	00040	20004	412
01F3C	XXM	0009F	00000	00808	00041	20004	406
01F3C	XXT	0009F	00000	00808	00040	20004	406
01F3C	XXT	0009F	00000	00808	00040	20004	412
01F3C	XXT	0009F	00000	0080C	00000	20000	401
01F4C	XXD	0009F	00000	00809	00040	20004	412
01F4C	XXM	0009F	00000	00809	00040	20004	254
01F4C	XXM	0009F	00000	00809	00040	20004	412
01F4C	XXT	0009F	00000	00809	00040	20004	412
01F64	XXD	0009F	00000	0080A	00040	20004	416
01F64	XXM	0009F	00000	0080A	00040	20004	416
01F64	XXT	0009F	00000	0080A	00040	20004	416
01F72	XXD	0009F	00000	00808	00040	20004	416
01F72	XXD	0009F	00000	00809	00040	20004	415
01F72	XXM	0009F	00000	00808	00040	20004	416
01F72	XXM	0009F	00000	00809	00040	20004	415
01F72	XXT	0009F	00000	00808	00040	20004	416
01F72	XXT	0009F	00000	00809	00040	20004	415
01F80	XXD	0009F	00000	0080A	00040	20004	413
01F80	XXD	0009F	00000	0080B	00040	20004	416
01F80	XXD	0009F	00000	0080B	00040	20004	417
01F80	XXM	0009F	00000	0080A	00040	20004	413
01F80	XXM	0009F	00000	0080B	00040	20004	416
01F80	XXM	0009F	00000	0080B	00040	20004	417
01F80	XXT	0009F	00000	0080A	00040	20004	413

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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01F80	XXT	0009F	00000	0080B	00040	20004	416
01F80	XXT	0009F	00000	0080B	00040	20004	417
01FAE	XXD	0009F	00000	00008	00040	20004	404
01FAE	XXD	0009F	00000	00809	00040	20004	404
01FAE	XXD	0009F	00000	00809	00040	20004	405
01FAE	XXD	0009F	00000	00809	00040	20004	414
01FAE	XXD	0009F	00000	00809	00040	20004	415
01FAE	XXD	0009F	00000	0080A	00040	00004	402
01FAE	XXD	0009F	00000	0080A	00040	20004	404
01FAE	XXD	0009F	00000	0080A	00040	20004	405
01FAE	XXD	0009F	00000	0080A	00040	20004	414
01FAE	XXD	0009F	00000	0080A	00040	20004	415
01FAE	XXD	0009F	00000	0080A	00040	20004	417
01FAE	XXM	0009F	00000	00008	00040	20004	404
01FAE	XXM	0009F	00000	00809	00040	20004	248
01FAE	XXM	0009F	00000	00809	00040	20004	291
01FAE	XXM	0009F	00000	00809	00040	20004	404
01FAE	XXM	0009F	00000	00809	00040	20004	405
01FAE	XXM	0009F	00000	00809	00040	20004	414
01FAE	XXM	0009F	00000	00809	00040	20004	415
01FAE	XXM	0009F	00000	0080A	00040	00004	402
01FAE	XXM	0009F	00000	0080A	00040	20004	248
01FAE	XXM	0009F	00000	0080A	00040	20004	291
01FAE	XXM	0009F	00000	0080A	00040	20004	404
01FAE	XXM	0009F	00000	0080A	00040	20004	405
01FAE	XXM	0009F	00000	0080A	00040	20004	414
01FAE	XXM	0009F	00000	0080A	00040	20004	415
01FAE	XXM	0009F	00000	0080A	00040	20004	417
01FAE	XXT	0009F	00000	00008	00040	20004	404
01FAE	XXT	0009F	00000	00809	00040	20004	404
01FAE	XXT	0009F	00000	00809	00040	20004	405
01FAE	XXT	0009F	00000	00809	00040	20004	414
01FAE	XXT	0009F	00000	00809	00040	20004	415
01FAE	XXT	0009F	00000	0080A	00040	00004	402
01FAE	XXT	0009F	00000	0080A	00040	20004	404
01FAE	XXT	0009F	00000	0080A	00040	20004	405
01FAE	XXT	0009F	00000	0080A	00040	20004	414
01FAE	XXT	0009F	00000	0080A	00040	20004	415
01FAE	XXT	0009F	00000	0080A	00040	20004	417
01FC2	XXM	0009F	00000	0080A	00040	20004	248

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
01FC2	XXM	0009F	00000	0080A	00040	20004	249	
01FCE	X M X	0009F	00000	00087	00001	20040	503	
01FE4	XXD	0009F	00000	00809	00040	20004	404	
01FE4	XXD	0009F	00000	00809	00040	20004	412	
01FE4	XXD	0009F	00000	00809	00040	20004	415	
01FE4	XXD	0009F	00000	00809	00040	20004	417	
01FE4	XXD	0009F	00000	0080A	00040	20004	406	
01FE4	XXD	0009F	00000	0080A	00040	20004	412	
01FE4	XXD	0009F	00000	0080A	00040	20004	415	
01FE4	XXD	0009F	00000	0080A	00040	20004	416	
01FE4	XXD	0009F	00000	0080A	00040	20004	419	
01FE4	XXD	0209F	00000	00809	00040	20004	412	
01FE4	XXM	0009F	00000	00809	00040	20004	248	
01FE4	XXM	0009F	00000	00809	00040	20004	290	
01FE4	XXM	0009F	00000	00809	00040	20004	404	
01FE4	XXM	0009F	00000	00809	00040	20004	412	
01FE4	XXM	0009F	00000	00809	00040	20004	415	
01FE4	XXM	0009F	00000	00809	00040	20004	417	
01FE4	XXM	0009F	00000	0080A	00040	20004	406	
01FE4	XXM	0009F	00000	0080A	00040	20004	412	
01FE4	XXM	0009F	00000	0080A	00040	20004	415	
01FE4	XXM	0009F	00000	0080A	00040	20004	416	
01FE4	XXM	0009F	00000	0080A	00040	20004	419	
01FE4	XXM	0209F	00000	00809	00040	20004	412	
01FE4	XXT	0009F	00000	00809	00040	20004	404	
01FE4	XXT	0009F	00000	00809	00040	20004	412	
01FE4	XXT	0009F	00000	00809	00040	20004	415	
01FE4	XXT	0009F	00000	00809	00040	20004	417	
01FE4	XXT	0009F	00000	0080A	00040	20004	406	
01FE4	XXT	0009F	00000	0080A	00040	20004	412	
01FE4	XXT	0009F	00000	0080A	00040	20004	415	
01FE4	XXT	0009F	00000	0080A	00040	20004	416	
01FE4	XXT	0009F	00000	0080A	00040	20004	419	
01FE4	XXT	0209F	00000	00809	00040	20004	412	
02012	XXM	0009F	00000	00009	00040	20004	216	
02016	XXT	0009F	00000	00808	00040	20004	650	X
02034	XXD						417	
02034	XXD	0009F	00000	0080A	00040	20004	405	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
02034	XXM						417	
02034	XXM	0009F	00000	00809	00040	20004	291	
02034	XXM	0009F	00000	0080A	00040	20004	405	
02034	XXT						417	
02034	XXT	0009F	00000	0080A	00040	20004	405	
02052	XXD	0009F	00000	00809	00040	20004	404	
02052	XXD	0009F	00000	00809	00040	20004	405	
02052	XXD	0009F	00000	00809	00040	20004	416	
02052	XXD	0009F	00000	0080A	00040	20004	410	
02052	XXD	0009F	00000	0080A	00040	20004	413	
02052	XXD	0009F	00000	0080A	00040	20004	414	
02052	XXD	0009F	00000	0080A	00040	20004	415	
02052	XXD	0009F	00000	0080A	00040	20004	417	
02052	XXD	0009F	00000	0080A	00040	20004	418	
02052	XXM	0009F	00000	0000A	00040	20004	413	
02052	XXM	0009F	00000	00809	00040	20004	404	
02052	XXM	0009F	00000	00809	00040	20004	405	
02052	XXM	0009F	00000	00809	00040	20004	416	
02052	XXM	0009F	00000	0080A	00040	20004	410	
02052	XXM	0009F	00000	0080A	00040	20004	413	
02052	XXM	0009F	00000	0080A	00040	20004	414	
02052	XXM	0009F	00000	0080A	00040	20004	415	
02052	XXM	0009F	00000	0080A	00040	20004	417	
02052	XXM	0009F	00000	0080A	00040	20004	418	
02052	XXT	0009F	00000	00809	00040	20004	404	
02052	XXT	0009F	00000	00809	00040	20004	405	
02052	XXT	0009F	00000	00809	00040	20004	416	
02052	XXT	0009F	00000	0080A	00040	20004	410	
02052	XXT	0009F	00000	0080A	00040	20004	413	
02052	XXT	0009F	00000	0080A	00040	20004	414	
02052	XXT	0009F	00000	0080A	00040	20004	415	
02052	XXT	0009F	00000	0080A	00040	20004	417	
02052	XXT	0009F	00000	0080A	00040	20004	418	
02066	XXD	0009F	00000	00809	00040	20004	401	
02066	XXD	0009F	00000	00809	00040	20004	404	
02066	XXD	0009F	00000	00809	00040	20004	415	
02066	XXD	0009F	00000	00809	00040	20004	417	
02066	XXM	0009F	00000	00809	00040	20004	401	
02066	XXM	0009F	00000	00809	00040	20004	404	
02066	XXM	0009F	00000	00809	00040	20004	415	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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02066	XXM	0009F	00000	00809	00040	20004	417	
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02066	XXT	0009F	00000	00809	00040	20004	401	
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02066	XXT	0009F	00000	00809	00040	20004	404	
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02066	XXT	0009F	00000	00809	00040	20004	415	
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02066	XXT	0009F	00000	00809	00040	20004	417	
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0207A	XXD	0009F	00000	00809	00040	20004	401	
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0207A	XXD	0009F	00000	00809	00040	20004	404	
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0207A	XXD	0009F	00000	00809	00040	20004	405	
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0207A	XXD	0009F	00000	00809	00040	20004	410	
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0207A	XXD	0009F	00000	00809	00040	20004	411	
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0207A	XXD	0009F	00000	00809	00040	20004	412	
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0207A	XXD	0009F	00000	00809	00040	20004	413	
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0207A	XXD	0009F	00000	00809	00040	20004	415	
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0207A	XXD	0009F	00000	0080A	00040	20004	404	
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0207A	XXD	0009F	00000	0080A	00040	20004	405	
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0207A	XXD	0009F	00000	0080A	00040	20004	411	
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0207A	XXD	0009F	00000	0080A	00040	20004	416	
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0207A	XXD	0009F	00000	0080A	00040	20004	418	
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0207A	XXD	0009F	00000	0080A	00041	20000	411	
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0207A	XXM	0009F	00000	00809	00040	20004	254	
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0207A	XXM	0009F	00000	00809	00040	20004	401	
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0207A	XXM	0009F	00000	00809	00040	20004	404	
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0207A	XXM	0009F	00000	00809	00040	20004	405	
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0207A	XXM	0009F	00000	00809	00040	20004	410	
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0207A	XXM	0009F	00000	00809	00040	20004	411	
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0207A	XXM	0009F	00000	00809	00040	20004	412	
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0207A	XXM	0009F	00000	00809	00040	20004	413	
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0207A	XXM	0009F	00000	00809	00040	20004	415	
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0207A	XXM	0009F	00000	0080A	00040	20004	254	
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0207A	XXM	0009F	00000	0080A	00040	20004	404	
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0207A	XXM	0009F	00000	0080A	00040	20004	405	
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0207A	XXM	0009F	00000	0080A	00040	20004	411	
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0207A	XXM	0009F	00000	0080A	00040	20004	416	
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0207A	XXM	0009F	00000	0080A	00040	20004	418	
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0207A	XXM	0009F	00000	0080A	00041	20000	411	
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0207A	XXT	0009F	00000	00809	00040	20004	401	
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0207A	XXT	0009F	00000	00809	00040	20004	404	
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0207A	XXT	0009F	00000	00809	00040	20004	405	
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0207A	XXT	0009F	00000	00809	00040	20004	410	
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0207A	XXT	0009F	00000	00809	00040	20004	411	
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0207A	XXT	0009F	00000	00809	00040	20004	412	
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0207A	XXT	0009F	00000	00809	00040	20004	413	
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0207A	XXT	0009F	00000	00809	00040	20004	415	
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0207A	XXT	0009F	00000	0080A	00040	20004	404	
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D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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0207A	XXT	0009F	00000	0080A	00040	20004	405
0207A	XXT	0009F	00000	0080A	00040	20004	411
0207A	XXT	0009F	00000	0080A	00040	20004	416
0207A	XXT	0009F	00000	0080A	00040	20004	418

0207A	XXT	0009F	00000	0080A	00041	20000	411
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0208A	XXM	0009F	00000	00809	00040	20004	401
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0208E	XXD	0009F	00000	00809	00040	20004	401
0208E	XXD	0009F	00000	00809	00040	20004	403
0208E	XXD	0009F	00000	00809	00040	20004	410
0208E	XXD	0009F	00000	00809	00040	20004	415
0208E	XXD	0009F	00000	00809	00040	20004	416

0208E	XXD	0009F	00000	0080A	00040	20004	402
0208E	XXD	0009F	00000	0080A	00040	20004	405
0208E	XXD	0009F	00000	0080A	00040	20004	410
0208E	XXD	0009F	00000	0080A	00040	20004	413
0208E	XXD	0009F	00000	0080A	00040	20004	414
0208E	XXD	0009F	00000	0080A	00040	20004	415

0208E	XXM	0009F	00000	00809	00040	20004	254
0208E	XXM	0009F	00000	00809	00040	20004	403
0208E	XXM	0009F	00000	00809	00040	20004	410
0208E	XXM	0009F	00000	00809	00040	20004	415
0208E	XXM	0009F	00000	00809	00040	20004	416

0208E	XXM	0009F	00000	0080A	00040	20004	402
0208E	XXM	0009F	00000	0080A	00040	20004	405
0208E	XXM	0009F	00000	0080A	00040	20004	410
0208E	XXM	0009F	00000	0080A	00040	20004	413
0208E	XXM	0009F	00000	0080A	00040	20004	414
0208E	XXM	0009F	00000	0080A	00040	20004	415

0208E	XXT	0009F	00000	00809	00040	20004	401
0208E	XXT	0009F	00000	00809	00040	20004	403
0208E	XXT	0009F	00000	00809	00040	20004	410
0208E	XXT	0009F	00000	00809	00040	20004	415
0208E	XXT	0009F	00000	00809	00040	20004	416

0208E	XXT	0009F	00000	0080A	00040	20004	402
0208E	XXT	0009F	00000	0080A	00040	20004	405
0208E	XXT	0009F	00000	0080A	00040	20004	410
0208E	XXT	0009F	00000	0080A	00040	20004	413
0208E	XXT	0009F	00000	0080A	00040	20004	414
0208E	XXT	0009F	00000	0080A	00040	20004	415

020A2	XXD	0009F	00000	00809	00040	20004	406
020A2	XXD	0009F	00000	00809	00040	20004	411

020A2	XXD	0009F	00000	0080A	00040	20004	413
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D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
020A2	XXM	0009F	00000	00809	00040	20004	406
020A2	XXM	0009F	00000	00809	00040	20004	411
020A2	XXM	0009F	00000	0080A	00040	20004	413
020A2	XXT	0009F	00000	00809	00040	20004	406
020A2	XXT	0009F	00000	00809	00040	20004	411
020A2	XXT	0009F	00000	0080A	00040	20004	413
020B6	XXD	0009F	00000	00809	00040	20004	403
020B6	XXD	0009F	00000	00809	00040	20004	410
020B6	XXD	0009F	00000	00809	00040	20004	412
020B6	XXD	0009F	00000	00809	00040	20004	416
020B6	XXD	0009F	00000	0080A	00040	20004	405
020B6	XXM	0009F	00000	00809	00040	20004	250
020B6	XXM	0009F	00000	00809	00040	20004	251
020B6	XXM	0009F	00000	00809	00040	20004	252
020B6	XXM	0009F	00000	00809	00040	20004	253
020B6	XXM	0009F	00000	00809	00040	20004	403
020B6	XXM	0009F	00000	00809	00040	20004	410
020B6	XXM	0009F	00000	00809	00040	20004	412
020B6	XXM	0009F	00000	00809	00040	20004	416
020B6	XXM	0009F	00000	0080A	00040	20004	162
020B6	XXM	0009F	00000	0080A	00040	20004	251
020B6	XXM	0009F	00000	0080A	00040	20004	405
020B6	XXT	0009F	00000	00809	00040	20004	403
020B6	XXT	0009F	00000	00809	00040	20004	410
020B6	XXT	0009F	00000	00809	00040	20004	412
020B6	XXT	0009F	00000	00809	00040	20004	416
020B6	XXT	0009F	00000	0080A	00040	20004	405
020BA	XXD	0009F	00000	00808	00040	20000	417
020BA	XXD	0009F	00000	00808	00040	20004	401
020BA	XXD	0009F	00000	00808	00040	20004	411
020BA	XXM	0009F	00000	00808	00040	20000	417
020BA	XXM	0009F	00000	00808	00040	20004	401
020BA	XXM	0009F	00000	00808	00040	20004	411
020BA	XXT	0009F	00000	00808	00040	20000	417
020BA	XXT	0009F	00000	00808	00040	20004	401
020BA	XXT	0009F	00000	00808	00040	20004	411
020D4	XXD	0009F	00000	00809	00040	20004	203

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
020D4	XXD	0009F	00000	00809	00040	20004	404
020D4	XXD	0009F	00000	00809	00040	20004	412
020D4	XXD	0009F	00000	00809	00040	20004	415
020D4	XXD	0009F	00000	0080A	00040	00004	414
020D4	XXD	0009F	00000	0080A	00040	20004	403
020D4	XXD	0009F	00000	0080A	00040	20004	404
020D4	XXD	0009F	00000	0080A	00040	20004	405
020D4	XXD	0009F	00000	0080A	00040	20004	412
020D4	XXD	0009F	00000	0080A	00040	20004	414
020D4	XXD	0009F	00000	0080A	00040	20004	415
020D4	XXM	0009F	00000	00009	00040	20004	413
020D4	XXM	0009F	00000	00809	00040	20004	203
020D4	XXM	0009F	00000	00809	00040	20004	248
020D4	XXM	0009F	00000	00809	00040	20004	250
020D4	XXM	0009F	00000	00809	00040	20004	404
020D4	XXM	0009F	00000	00809	00040	20004	412
020D4	XXM	0009F	00000	00809	00040	20004	415
020D4	XXM	0009F	00000	0080A	00040	00004	414
020D4	XXM	0009F	00000	0080A	00040	20004	403
020D4	XXM	0009F	00000	0080A	00040	20004	404
020D4	XXM	0009F	00000	0080A	00040	20004	405
020D4	XXM	0009F	00000	0080A	00040	20004	412
020D4	XXM	0009F	00000	0080A	00040	20004	414
020D4	XXM	0009F	00000	0080A	00040	20004	415
020D4	XXT	0009F	00000	00809	00040	20004	203
020D4	XXT	0009F	00000	00809	00040	20004	404
020D4	XXT	0009F	00000	00809	00040	20004	412
020D4	XXT	0009F	00000	00809	00040	20004	415
020D4	XXT	0009F	00000	0080A	00040	00004	414
020D4	XXT	0009F	00000	0080A	00040	20004	403
020D4	XXT	0009F	00000	0080A	00040	20004	404
020D4	XXT	0009F	00000	0080A	00040	20004	405
020D4	XXT	0009F	00000	0080A	00040	20004	412
020D4	XXT	0009F	00000	0080A	00040	20004	414
020D4	XXT	0009F	00000	0080A	00040	20004	415
020E8	XXD	0009F	00000	0080A	00040	20004	406
020E8	XXM	0009F	00000	0080A	00040	20004	406
020E8	XXT	0009F	00000	0080A	00040	20004	406
020F6	X M X	2409F	00240	0080C	00000	11808	401

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
02138	XXT	0009F	00000	00809	00040	20004	214
02160	XXD	0009F	00000	0080A	00040	20004	403
02160	XXM	0009F	00000	0080A	00040	20004	403
02160	XXT	0009F	00000	0080A	00040	20004	403
02184	XXD	0009F	00000	00808	00002	20040	407
02184	XXM	0009F	00000	00808	00002	20040	407
02184	XXT	0009F	00000	00808	00002	20040	407
021A4	XXD	0009F	00000	00808	00040	20004	401
021A4	XXD	0009F	00000	00808	00040	20004	403
021A4	XXD	0009F	00000	00808	00040	20004	404
021A4	XXD	0009F	00000	00808	00040	20004	406
021A4	XXD	0009F	00000	00808	00040	20004	407
021A4	XXD	0009F	00000	00808	00040	20004	410
021A4	XXD	0009F	00000	00808	00040	20004	411
021A4	XXD	0009F	00000	00808	00040	20004	414
021A4	XXD	0009F	00000	00808	00040	20004	416
021A4	XXD	0009F	00000	00808	00040	20004	417
021A4	XXD	0009F	00000	00808	00040	20004	516
021A4	XXM	0009F	00000	00808	00040	20004	290
021A4	XXM	0009F	00000	00808	00040	20004	401
021A4	XXM	0009F	00000	00808	00040	20004	403
021A4	XXM	0009F	00000	00808	00040	20004	404
021A4	XXM	0009F	00000	00808	00040	20004	406
021A4	XXM	0009F	00000	00808	00040	20004	407
021A4	XXM	0009F	00000	00808	00040	20004	410
021A4	XXM	0009F	00000	00808	00040	20004	411
021A4	XXM	0009F	00000	00808	00040	20004	414
021A4	XXM	0009F	00000	00808	00040	20004	416
021A4	XXM	0009F	00000	00808	00040	20004	417
021A4	XXM	0009F	00000	00808	00040	20004	516
021A4	XXT	0009F	00000	00808	00040	20004	401
021A4	XXT	0009F	00000	00808	00040	20004	403
021A4	XXT	0009F	00000	00808	00040	20004	404
021A4	XXT	0009F	00000	00808	00040	20004	406
021A4	XXT	0009F	00000	00808	00040	20004	407
021A4	XXT	0009F	00000	00808	00040	20004	410
021A4	XXT	0009F	00000	00808	00040	20004	411
021A4	XXT	0009F	00000	00808	00040	20004	412
021A4	XXT	0009F	00000	00808	00040	20004	414
021A4	XXT	0009F	00000	00808	00040	20004	416
021A4	XXT	0009F	00000	00808	00040	20004	417
021A4	XXT	0009F	00000	00808	00040	20004	516
021B8	XXM	0009F	00000	0000B	00040	20000	290

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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021E2	XXD		0009F	00000	00809	00040	20004	211
021E2	XXD		0009F	00000	00809	00040	20004	407
021E2	XXM		0009F	00000	00809	00040	20004	209
021E2	XXM		0009F	00000	00809	00040	20004	211
021E2	XXM		0009F	00000	00809	00040	20004	407
021E2	XXT		0009F	00000	00809	00040	20004	211
021E2	XXT		0009F	00000	00809	00040	20004	407
02298	XXM		0009F	00000	28009	00040	20004	215
022DC	X D X		0009F	00000	0080C	00000	20000	402
022DC	X D X		0009F	00000	0080C	00000	20000	408
022DC	X D X		0009F	00000	0080C	00000	20000	409
022DC	X D X		0009F	00000	0080C	00000	20000	413
022DC	X D X		0009F	00000	0080C	00000	20000	418
022DC	X D X		0409F	00000	0080C	00000	20000	417
022DC	X M X		0009F	00000	0080C	00000	20000	153
022DC	X M X		0009F	00000	0080C	00000	20000	402
022DC	X M X		0009F	00000	0080C	00000	20000	408
022DC	X M X		0009F	00000	0080C	00000	20000	409
022DC	X M X		0009F	00000	0080C	00000	20000	413
022DC	X M X		0009F	00000	0080C	00000	20000	418
022DC	X M X		0409F	00000	0080C	00000	20000	417
022DC	X T X		0009F	00000	0080C	00000	20000	402
022DC	X T X		0009F	00000	0080C	00000	20000	408
022DC	X T X		0009F	00000	0080C	00000	20000	409
022DC	X T X		0009F	00000	0080C	00000	20000	413
022DC	X T X		0009F	00000	0080C	00000	20000	418
022DC	X T X		0409F	00000	0080C	00000	20000	417
022DD	X D X		0009F	00000	0080C	00000	20000	402
022DD	X D X		0009F	00000	0080C	00000	20000	409
022DD	X D X		0009F	00000	0080C	00000	20000	418
022DD	X D X		0409F	00000	0080C	00000	20000	418
022DD	X D X		2009F	00000	0080C	00000	20000	409
022DD	X D X		2409F	00000	0080C	00000	20000	402
022DD	X D X		2409F	00000	0080C	00000	20000	409
022DD	X D X		2409F	00000	0080C	00000	20000	413
022DD	X M X		0009F	00000	0080C	00000	20000	402
022DD	X M X		0009F	00000	0080C	00000	20000	409
022DD	X M X		0009F	00000	0080C	00000	20000	418

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
022DD	X	M	X	0409F	00000	0080C	00000	20000 418
022DD	X	M	X	2009F	00000	0080C	00000	20000 409
022DD	X	M	X	2409F	00000	0080C	00000	20000 402
022DD	X	M	X	2409F	00000	0080C	00000	20000 409
022DD	X	M	X	2409F	00000	0080C	00000	20000 413
022DD	X	T	X	0009F	00000	0080C	00000	20000 402
022DD	X	T	X	0009F	00000	0080C	00000	20000 409
022DD	X	T	X	0009F	00000	0080C	00000	20000 418
022DD	X	T	X	0409F	00000	0080C	00000	20000 418
022DD	X	T	X	2009F	00000	0080C	00000	20000 409
022DD	X	T	X	2409F	00000	0080C	00000	20000 402
022DD	X	T	X	2409F	00000	0080C	00000	20000 409
022DD	X	T	X	2409F	00000	0080C	00000	20000 413
022E0	X	D	X	3409F	00000	0080C	00000	20000 401
022E0	X	D	X	3409F	00000	0080C	00000	20000 407
022E0	X	D	X	3409F	00000	0080C	00000	20000 409
022E0	X	D	X	3409F	00000	0080C	00000	20000 413
022E0	X	D	X	3409F	00000	0080C	00000	20000 504
022E0	X	M	X	3409F	00000	0080C	00000	20000 401
022E0	X	M	X	3409F	00000	0080C	00000	20000 407
022E0	X	M	X	3409F	00000	0080C	00000	20000 409
022E0	X	M	X	3409F	00000	0080C	00000	20000 413
022E0	X	M	X	3409F	00000	0080C	00000	20000 504
022E0	X	T	X	3409F	00000	0080C	00000	20000 401
022E0	X	T	X	3409F	00000	0080C	00000	20000 407
022E0	X	T	X	3409F	00000	0080C	00000	20000 409
022E0	X	T	X	3409F	00000	0080C	00000	20000 413
022E0	X	T	X	3409F	00000	0080C	00000	20000 504
022E3	X	M	X	0F09F	003C0	0000E	00000	00000 417
0234F	X	D	X	0989F	00000	0080C	00000	20000 410
0234F	X	M	X	0989F	00000	0080C	00000	20000 410
0234F	X	T	X	0989F	00000	0080C	00000	20000 410
0235A	X	D	X	1C09F	00000	0080C	00000	20000 417
0235A	X	M	X	1C09F	00000	0080C	00000	20000 417
0235A	X	T	X	1C09F	00000	0080C	00000	20000 417
0235B	X	D	X	3009F	00000	0080E	00000	20000 413

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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0235B	X	D	X	3909F	00000	0080C	00000	20000 417
0235B	X	D	X	3D09F	00000	0080E	00000	20000 401
0235B	X	M	X	3009F	00000	0080E	00000	20000 413
0235B	X	M	X	3909F	00000	0080C	00000	20000 417
0235B	X	M	X	3D09F	00000	0080E	00000	20000 401
0235B	X	T	X	3009F	00000	0080E	00000	20000 413
0235B	X	T	X	3909F	00000	0080C	00000	20000 417
0235B	X	T	X	3D09F	00000	0080E	00000	20000 401
0235F	X	D	X	0909F	00000	0080C	00000	20000 417
0235F	X	D	X	2D09F	00000	0080D	00000	20000 413
0235F	X	M	X	0909F	00000	0080C	00000	20000 417
0235F	X	M	X	2D09F	00000	0080D	00000	20000 413
0235F	X	T	X	0909F	00000	0080C	00000	20000 417
0235F	X	T	X	2D09F	00000	0080D	00000	20000 413
0236F	X	D	X	1909F	00000	0080C	00000	20000 413
0236F	X	D	X	1909F	00000	0080C	00000	20000 417
0236F	X	M	X	1909F	00000	0080C	00000	20000 413
0236F	X	M	X	1909F	00000	0080C	00000	20000 417
0236F	X	T	X	1909F	00000	0080C	00000	20000 413
0236F	X	T	X	1909F	00000	0080C	00000	20000 417
023B4	X	T	X	2409F	003C0	0080C	00000	00000 401
0240B	X	D	X	0409F	00000	0080C	00000	20000 403
0240B	X	D	X	0409F	00000	0080C	00000	20000 417
0240B	X	D	X	0409F	00000	0080C	00000	20000 512
0240B	X	M	X	0409F	00000	0080C	00000	20000 403
0240B	X	M	X	0409F	00000	0080C	00000	20000 417
0240B	X	M	X	0409F	00000	0080C	00000	20000 512
0240B	X	T	X	0409F	00000	0080C	00000	20000 403
0240B	X	T	X	0409F	00000	0080C	00000	20000 417
0240B	X	T	X	0409F	00000	0080C	00000	20000 512
02418	XXD			1409F	00000	0080C	00000	20000 417

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
0241B	XXM	1409F	00000	0080C	00000	20000	417	
0241B	XXT	1409F	00000	0080C	00000	20000	417	
0241A	X D X	2709F	00000	0080C	00000	20000	417	
0241A	X D X	2709F	00000	0080C	00000	20004	401	
0241A	X M X	2709F	00000	0080C	00000	20000	417	
0241A	X M X	2709F	00000	0080C	00000	20004	401	
0241A	X T X	2709F	00000	0080C	00000	20000	417	
0241A	X T X	2709F	00000	0080C	00000	20004	401	
0241B	X D X	0409F	00000	0080C	00000	20000	401	
0241B	X D X	0409F	00000	0080C	00000	20000	407	
0241B	X D X	2109F	00000	0080C	00000	20000	411	
0241B	X D X	2509F	00000	0080C	00000	20000	401	
0241B	X D X	2509F	00000	0080C	00000	20000	413	
0241B	X M X	0409F	00000	0080C	00000	20000	401	
0241B	X M X	0409F	00000	0080C	00000	20000	407	
0241B	X M X	2109F	00000	0080C	00000	20000	411	
0241B	X M X	2509F	00000	0080C	00000	20000	401	
0241B	X M X	2509F	00000	0080C	00000	20000	413	
0241B	X T X	0409F	00000	0080C	00000	20000	401	
0241B	X T X	0409F	00000	0080C	00000	20000	407	
0241B	X T X	2109F	00000	0080C	00000	20000	411	
0241B	X T X	2509F	00000	0080C	00000	20000	401	
0241B	X T X	2509F	00000	0080C	00000	20000	413	
0242B	X D X	0B09F	00000	0080C	00000	20000	403	
0242B	X D X	0B09F	00000	0080C	00000	20000	404	
0242B	X D X	0B09F	00000	0080C	00000	20000	410	
0242B	X D X	0B09F	00000	0080C	00000	20000	414	
0242B	X M X	0B09F	00000	0080C	00000	20000	403	
0242B	X M X	0B09F	00000	0080C	00000	20000	404	
0242B	X M X	0B09F	00000	0080C	00000	20000	410	
0242B	X M X	0B09F	00000	0080C	00000	20000	414	
0242B	X T X	0B09F	00000	0080C	00000	20000	403	
0242B	X T X	0B09F	00000	0080C	00000	20000	404	
0242B	X T X	0B09F	00000	0080C	00000	20000	410	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
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0242B	X	T	X	0B09F	00000	0080C	00000	20000 414
02434	X	D	X	1809F	00000	0080C	00000	20000 401
02434	X	M	X	1809F	00000	0080C	00000	20000 401
02434	X	T	X	1809F	00000	0080C	00000	20000 401
02437	X	D	X	0A09F	00000	0080C	00000	20000 406
02437	X	D	X	0A09F	00000	0080C	00000	20000 412
02437	X	D	X	0B08F	00000	0080C	00000	20000 410
02437	X	D	X	0B09F	00000	0080C	00000	20000 405
02437	X	M	X	0A09F	00000	0080C	00000	20000 406
02437	X	M	X	0A09F	00000	0080C	00000	20000 412
02437	X	M	X	0B08F	00000	0080C	00000	20000 410
02437	X	M	X	0B09F	00000	0080C	00000	20000 405
02437	X	T	X	0A09F	00000	0080C	00000	20000 406
02437	X	T	X	0A09F	00000	0080C	00000	20000 412
02437	X	T	X	0B08F	00000	0080C	00000	20000 410
02437	X	T	X	0B09F	00000	0080C	00000	20000 405
02459	X	M	X	0E09F	00000	0080C	00000	20000 250
02459	X	M	X	2E09F	00000	0080C	00000	20000 251
0245A	XXM			0009F	00000	00008	00041	20000 250
0245C	XXM			0009F	00000	00008	00040	20004 289
02467	X	D	X	1809F	00000	0080C	00000	20002 401
02467	X	D	X	1809F	00000	0080C	00000	20002 417
02467	X	D	X	3A09F	00000	0080C	00000	20000 417
02467	X	D	X	3E09F	00000	0080C	00000	20000 413
02467	X	D	X	3E09F	00000	0080C	00000	20000 417
02467	X	M	X	1809F	00000	0080C	00000	20002 401
02467	X	M	X	1809F	00000	0080C	00000	20002 417
02467	X	M	X	3A09F	00000	0080C	00000	20000 417
02467	X	M	X	3E09F	00000	0080C	00000	20000 413
02467	X	M	X	3E09F	00000	0080C	00000	20000 417

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
02467	X	T	X	1809F	00000	0080C	00000	20002 401
02467	X	T	X	1809F	00000	0080C	00000	20002 417
02467	X	T	X	3A09F	00000	0080C	00000	20000 417
02467	X	T	X	3E09F	00000	0080C	00000	20000 413
02467	X	T	X	3E09F	00000	0080C	00000	20000 417
02469	X	D	X	0009F	00000	0080C	00000	20000 415
02469	X	D	X	3609F	00000	0080C	00000	20000 411
02469	X	D	X	3609F	00000	0080C	00000	20000 416
02469	X	M	X	0009F	00000	0080C	00000	20000 415
02469	X	M	X	3609F	00000	0080C	00000	20000 411
02469	X	M	X	3609F	00000	0080C	00000	20000 416
02469	X	T	X	0009F	00000	0080C	00000	20000 415
02469	X	T	X	3609F	00000	0080C	00000	20000 411
02469	X	T	X	3609F	00000	0080C	00000	20000 416
024CD	X	D	X	1E09F	00000	00D8C	00000	20040 413
024CD	X	M	X	1E09F	00000	00D8C	00000	20040 413
024CD	X	T	X	1E09F	00000	00D8C	00000	20040 413
024CF	X	D	X	1A09F	00000	0080C	00000	20000 407
024CF	X	M	X	1A09F	00000	0080C	00000	20000 407
024CF	X	T	X	1A09F	00000	0080C	00000	20000 407
024D6	X	D	X	0009F	00000	0080C	00000	00000 411
024D6	X	D	X	0809F	00000	0080C	00000	20000 401
024D6	X	D	X	0809F	00000	0080C	00000	20000 402
024D6	X	M	X	0009F	00000	0080C	00000	00000 411
024D6	X	M	X	0809F	00000	0080C	00000	20000 401
024D6	X	M	X	0809F	00000	0080C	00000	20000 402
024D6	X	T	X	0009F	00000	0080C	00000	00000 411
024D6	X	T	X	0809F	00000	0080C	00000	20000 401
024D6	X	T	X	0809F	00000	0080C	00000	20000 402
024D7	X	D	X	0C09F	00000	0080C	00000	20000 402
024D7	X	M	X	0C09F	00000	0080C	00000	20000 402

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
024D7	X T X	0C09F	00000	0080C	00000	20000	402	
0261C	X D X	0009F	00000	00AB8	00005	20048	504	
0261C	X D X	0009F	00000	00AB8	00005	20048	517	
0261C	X M X	0009F	00000	00AB8	00005	20048	204	
0261C	X M X	0009F	00000	00AB8	00005	20048	225	
0261C	X M X	0009F	00000	00AB8	00005	20048	288	
0261C	X M X	0009F	00000	00AB8	00005	20048	504	
0261C	X M X	0009F	00000	00AB8	00005	20048	517	
0261C	X T X	0009F	00000	00AB8	00005	20048	504	
0261C	X T X	0009F	00000	00AB8	00005	20048	517	
0266C	XXD	0009F	00000	00808	00040	00000	506	
0266C	XXD	0009F	00000	00808	00040	20000	504	
0266C	XXD	0009F	00000	00808	00040	20000	516	
0266C	XXD	0009F	00000	00808	00040	20000	517	
0266C	XXM	0009F	00000	00808	00040	00000	506	
0266C	XXM	0009F	00000	00808	00040	20000	204	
0266C	XXM	0009F	00000	00808	00040	20000	504	
0266C	XXM	0009F	00000	00808	00040	20000	516	
0266C	XXM	0009F	00000	00808	00040	20000	517	
0266C	XXT	0009F	00000	00808	00040	00000	506	
0266C	XXT	0009F	00000	00808	00040	20000	504	
0266C	XXT	0009F	00000	00808	00040	20000	516	
0266C	XXT	0009F	00000	00808	00040	20000	517	
026DE	XXD	0009F	00000	00809	00040	20004	510	
026DE	XXD	0009F	00000	0080A	00040	20004	517	
026DE	XXM	0009F	00000	00809	00040	20004	510	
026DE	XXM	0009F	00000	0080A	00040	20004	517	
026DE	XXT	0009F	00000	00809	00040	20004	510	
026DE	XXT	0009F	00000	0080A	00040	20004	517	
026EA	XXD	0009F	00000	0080A	00040	20004	505	
026EA	XXD	0009F	00000	0080A	00040	20004	517	
026EA	XXM	0009F	00000	0080A	00040	20004	225	
026EA	XXM	0009F	00000	0080A	00040	20004	505	
026EA	XXM	0009F	00000	0080A	00040	20004	517	
026EA	XXT	0009F	00000	0080A	00040	20004	505	

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
026EA	XXT	0009F	00000	0080A	00040	20004	517	
02736	XXD	0009F	00000	00808	00040	20000	506	
02736	XXM	0009F	00000	00808	00040	20000	216	
02736	XXM	0009F	00000	00808	00040	20000	506	
02736	XXT	0009F	00000	00808	00040	20000	506	
02752	X T X	0009F	00000	0000C	00001	20000	509	
0279E	X D X	0009F	00000	00808	00000	20000	508	
0279E	X M X	0009F	00000	00808	00000	20000	508	
0279E	X T X	0009F	00000	00808	00000	20000	508	
027AC	XXD	0009F	00000	00809	00040	20000	215	
027AC	XXD	0009F	00000	00809	00041	20000	506	
027AC	XXD	0009F	00000	00809	00041	20000	507	
027AC	XXD	0009F	00000	0080A	00040	20004	505	
027AC	XXD	0009F	00000	0080A	00041	20000	209	
027AC	XXD	0009F	00000	0080A	00041	20000	510	
027AC	XXD	0009F	00000	0080A	00042	20000	504	
027AC	XXM	0009F	00000	00809	00040	20000	215	
027AC	XXM	0009F	00000	00809	00041	20000	506	
027AC	XXM	0009F	00000	00809	00041	20000	507	
027AC	XXM	0009F	00000	00809	00041	20000	509	
027AC	XXM	0009F	00000	0080A	00040	20004	505	
027AC	XXM	0009F	00000	0080A	00041	20000	209	
027AC	XXM	0009F	00000	0080A	00041	20000	510	
027AC	XXM	0009F	00000	0080A	00042	20000	504	
027AC	XXT	0009F	00000	00809	00040	20000	215	
027AC	XXT	0009F	00000	00809	00041	20000	506	
027AC	XXT	0009F	00000	00809	00041	20000	507	
027AC	XXT	0009F	00000	0080A	00040	20004	505	
027AC	XXT	0009F	00000	0080A	00041	20000	209	
027AC	XXT	0009F	00000	0080A	00041	20000	510	
027AC	XXT	0009F	00000	0080A	00042	20000	504	

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
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027CA	XXD	0009F	00000	00809	00040	20000	508
027CA	XXD	0009F	00000	00809	00040	20000	517
027CA	XXD	0009F	00000	00809	00041	00000	506
027CA	XXD	0009F	00000	00809	00041	20000	505
027CA	XXD	0009F	00000	00809	00041	20000	508
027CA	XXD	0009F	00000	00809	00041	20000	512
027CA	XXD	0009F	00000	0080A	00040	20004	506
027CA	XXD	0009F	00000	0080A	00041	20000	506
027CA	XXD	0009F	00000	0080A	00041	20000	507
027CA	XXD	0009F	00000	0080A	00041	20000	508
027CA	XXD	0009F	00000	0080A	00041	20000	510
027CA	XXD	0009F	00000	0080A	00041	20000	512
027CA	XXM	0009F	00000	00809	00040	20000	508
027CA	XXM	0009F	00000	00809	00040	20000	517
027CA	XXM	0009F	00000	00809	00041	00000	506
027CA	XXM	0009F	00000	00809	00041	20000	225
027CA	XXM	0009F	00000	00809	00041	20000	249
027CA	XXM	0009F	00000	00809	00041	20000	292
027CA	XXM	0009F	00000	00809	00041	20000	505
027CA	XXM	0009F	00000	00809	00041	20000	508
027CA	XXM	0009F	00000	00809	00041	20000	512
027CA	XXM	0009F	00000	0080A	00040	20004	506
027CA	XXM	0009F	00000	0080A	00041	00400	204
027CA	XXM	0009F	00000	0080A	00041	20000	285
027CA	XXM	0009F	00000	0080A	00041	20000	506
027CA	XXM	0009F	00000	0080A	00041	20000	507
027CA	XXM	0009F	00000	0080A	00041	20000	508
027CA	XXM	0009F	00000	0080A	00041	20000	510
027CA	XXM	0009F	00000	0080A	00041	20000	512
027CA	XXT	0009F	00000	00809	00040	20000	508
027CA	XXT	0009F	00000	00809	00040	20000	517
027CA	XXT	0009F	00000	00809	00041	00000	506
027CA	XXT	0009F	00000	00809	00041	20000	505
027CA	XXT	0009F	00000	00809	00041	20000	508
027CA	XXT	0009F	00000	00809	00041	20000	512
027CA	XXT	0009F	00000	0080A	00040	20004	506
027CA	XXT	0009F	00000	0080A	00041	20000	506
027CA	XXT	0009F	00000	0080A	00041	20000	507

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
027CA	XXT	0009F	00000	0080A	00041	20000	508	
027CA	XXT	0009F	00000	0080A	00041	20000	510	
027CA	XXT	0009F	00000	0080A	00041	20000	512	
027E6	XXD	0009F	00000	0080A	00040	20004	509	
027E6	XXD	0009F	00000	0080A	00041	00000	506	
027E6	XXM	0009F	00000	0080A	00040	20004	506	
027E6	XXM	0009F	00000	0080A	00040	20004	509	
027E6	XXM	0009F	00000	0080A	00041	00000	506	
027E6	XXM	0009F	00000	0080A	00041	20000	249	
027E6	XXT	0009F	00000	0080A	00040	20004	509	
027E6	XXT	0009F	00000	0080A	00041	00000	506	
02804	XXD	0009F	00000	0080A	00041	00000	506	
02804	XXM	0009F	00000	0080A	00041	00000	506	
02804	XXM	0009F	00000	0080A	00041	20000	249	
02804	XXT	0009F	00000	0080A	00041	00000	506	
02826	XXD	0009F	00000	00809	00040	20000	506	
02826	XXM	0009F	00000	00809	00040	20000	506	
02826	XXT	0009F	00000	00809	00040	20000	506	
02838	XXD	0009F	00000	00808	00041	00020	509	
02838	XXD	0009F	00000	00808	00041	20000	508	
02838	XXD	0009F	00000	00808	00041	20000	515	
02838	XXM	0009F	00000	00808	00041	00020	509	
02838	XXM	0009F	00000	00808	00041	20000	508	
02838	XXM	0009F	00000	00808	00041	20000	515	
02838	XXT	0009F	00000	00808	00041	00020	509	
02838	XXT	0009F	00000	00808	00041	20000	508	
02838	XXT	0009F	00000	00808	00041	20000	515	
0285E	XXD	0009F	00000	0080A	00040	20000	509	
0285E	XXM	0009F	00000	0080A	00040	20000	509	
0285E	XXT	0009F	00000	0080A	00040	20000	509	

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
0287C	XXD	0009F	00000	00809	00040	20000	505
0287C	XXD	0009F	00000	00809	00040	20004	504
0287C	XXD	0009F	00000	00809	00041	20000	503
0287C	XXD	0009F	00000	00809	00041	20000	504
0287C	XXD	0009F	00000	00809	00041	20000	505
0287C	XXD	0009F	00000	00809	00041	20000	506
0287C	XXD	0009F	00000	00809	00041	20000	510
0287C	XXD	0009F	00000	0080A	00041	20000	504
0287C	XXD	0009F	00000	0080A	00041	20000	512
0287C	XXM	0009F	00000	00809	00040	20000	505
0287C	XXM	0009F	00000	00809	00040	20004	504
0287C	XXM	0009F	00000	00809	00041	20000	225
0287C	XXM	0009F	00000	00809	00041	20000	503
0287C	XXM	0009F	00000	00809	00041	20000	504
0287C	XXM	0009F	00000	00809	00041	20000	505
0287C	XXM	0009F	00000	00809	00041	20000	506
0287C	XXM	0009F	00000	00809	00041	20000	510
0287C	XXM	0009F	00000	0080A	00041	20000	504
0287C	XXM	0009F	00000	0080A	00041	20000	512
0287C	XXT	0009F	00000	00809	00040	20000	505
0287C	XXT	0009F	00000	00809	00040	20004	504
0287C	XXT	0009F	00000	00809	00041	20000	503
0287C	XXT	0009F	00000	00809	00041	20000	504
0287C	XXT	0009F	00000	00809	00041	20000	505
0287C	XXT	0009F	00000	00809	00041	20000	506
0287C	XXT	0009F	00000	00809	00041	20000	510
0287C	XXT	0009F	00000	0080A	00041	20000	504
0287C	XXT	0009F	00000	0080A	00041	20000	512
028B6	XXM	0009F	00000	00009	00040	20000	401
028F2	XXD	0009F	00000	00809	00040	20004	402
028F2	XXD	0009F	00000	00809	00040	20004	411
028F2	XXD	0009F	00000	00809	00040	20004	417
028F2	XXM	0009F	00000	00809	00040	20004	402
028F2	XXM	0009F	00000	00809	00040	20004	411
028F2	XXM	0009F	00000	00809	00040	20004	417
028F2	XXT	0009F	00000	00809	00040	20004	402
028F2	XXT	0009F	00000	00809	00040	20004	411
028F2	XXT	0009F	00000	00809	00040	20004	417

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
02906	XXD	0009F	00000	0080A	00040	20004	404
02906	XXD	0009F	00000	0080A	00040	20004	411
02906	XXM	0009F	00000	0080A	00040	20004	404
02906	XXM	0009F	00000	0080A	00040	20004	411
02906	XXT	0009F	00000	0080A	00040	20004	404
02906	XXT	0009F	00000	0080A	00040	20004	411
02938	XXD	0009F	00000	00808	00040	20004	404
02938	XXM	0009F	00000	00808	00040	20004	404
02938	XXT	0009F	00000	00808	00040	20004	404
02952	XXD	0009F	00000	00809	00040	20004	203
02952	XXD	0009F	00000	00809	00040	20004	401
02952	XXD	0009F	00000	00809	00040	20004	404
02952	XXD	0009F	00000	00809	00040	20004	405
02952	XXD	0009F	00000	00809	00040	20004	410
02952	XXD	0009F	00000	00809	00040	20004	412
02952	XXD	0009F	00000	00809	00040	20004	414
02952	XXD	0009F	00000	00809	00040	20004	415
02952	XXD	0009F	00000	00809	00040	20004	416
02952	XXD	0009F	00000	00809	00040	20004	417
02952	XXD	0009F	00000	0080A	00040	20004	403
02952	XXD	0009F	00000	0080A	00040	20004	405
02952	XXD	0009F	00000	0080A	00040	20004	407
02952	XXD	0009F	00000	0080A	00040	20004	410
02952	XXD	0009F	00000	0080A	00040	20004	412
02952	XXD	0009F	00000	0080A	00040	20004	413
02952	XXD	0009F	00000	0080A	00040	20004	414
02952	XXD	0009F	00000	0080A	00040	20004	415
02952	XXM	0009F	00000	00809	00040	20004	203
02952	XXM	0009F	00000	00809	00040	20004	217
02952	XXM	0009F	00000	00809	00040	20004	254
02952	XXM	0009F	00000	00809	00040	20004	401
02952	XXM	0009F	00000	00809	00040	20004	404
02952	XXM	0009F	00000	00809	00040	20004	405
02952	XXM	0009F	00000	00809	00040	20004	410
02952	XXM	0009F	00000	00809	00040	20004	412
02952	XXM	0009F	00000	00809	00040	20004	414
02952	XXM	0009F	00000	00809	00040	20004	415
02952	XXM	0009F	00000	00809	00040	20004	416
02952	XXM	0009F	00000	00809	00040	20004	417
02952	XXM	0009F	00000	0080A	00040	20004	254
02952	XXM	0009F	00000	0080A	00040	20004	403
02952	XXM	0009F	00000	0080A	00040	20004	405
02952	XXM	0009F	00000	0080A	00040	20004	407
02952	XXM	0009F	00000	0080A	00040	20004	410

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
02952	XXM	0009F	00000	0080A	00040	20004	412
02952	XXM	0009F	00000	0080A	00040	20004	413
02952	XXM	0009F	00000	0080A	00040	20004	414
02952	XXM	0009F	00000	0080A	00040	20004	415
02952	XXT	0009F	00000	00809	00040	20004	203
02952	XXT	0009F	00000	00809	00040	20004	401
02952	XXT	0009F	00000	00809	00040	20004	404
02952	XXT	0009F	00000	00809	00040	20004	405
02952	XXT	0009F	00000	00809	00040	20004	410
02952	XXT	0009F	00000	00809	00040	20004	412
02952	XXT	0009F	00000	00809	00040	20004	414
02952	XXT	0009F	00000	00809	00040	20004	415
02952	XXT	0009F	00000	00809	00040	20004	416
02952	XXT	0009F	00000	00809	00040	20004	417
02952	XXT	0009F	00000	0080A	00040	20004	403
02952	XXT	0009F	00000	0080A	00040	20004	405
02952	XXT	0009F	00000	0080A	00040	20004	407
02952	XXT	0009F	00000	0080A	00040	20004	410
02952	XXT	0009F	00000	0080A	00040	20004	412
02952	XXT	0009F	00000	0080A	00040	20004	413
02952	XXT	0009F	00000	0080A	00040	20004	414
02952	XXT	0009F	00000	0080A	00040	20004	415
02966	XXD	0009F	00000	00809	00040	20004	405
02966	XXD	0009F	00000	0080A	00040	20004	410
02966	XXD	0009F	00000	0080A	00040	20004	411
02966	XXM	0009F	00000	00809	00040	20004	405
02966	XXM	0009F	00000	0080A	00040	20004	254
02966	XXM	0009F	00000	0080A	00040	20004	410
02966	XXM	0009F	00000	0080A	00040	20004	411
02966	XXT	0009F	00000	00809	00040	20004	405
02966	XXT	0009F	00000	0080A	00040	20004	410
02966	XXT	0009F	00000	0080A	00040	20004	411
0297A	XXD	0009F	00000	00809	00040	20004	410
0297A	XXD	0009F	00000	00809	00040	20004	416
0297A	XXM	0009F	00000	00809	00040	20004	254
0297A	XXM	0009F	00000	00809	00040	20004	410
0297A	XXM	0009F	00000	00809	00040	20004	416
0297A	XXT	0009F	00000	00809	00040	20004	410
0297A	XXT	0009F	00000	00809	00040	20004	416
0298E	XXD	0009F	00000	00809	00040	20004	411

D1	LSURL	A2	B3	C1	C3	D3	FIG LOAD
0298E	XXD	0009F	00000	0080A	00040	20004	410
0298E	XXM	0009F	00000	00809	00040	20004	254
0298E	XXM	0009F	00000	00809	00040	20004	411
0298E	XXM	0009F	00000	0080A	00040	20004	410
0298E	XXT	0009F	00000	00809	00040	20004	411
029A2	XXD	0009F	00000	0080A	00040	20004	410
029A2	XXD	0009F	00000	0080A	00040	20004	413
029A2	XXD	0009F	00000	0080A	00040	20004	416
029A2	XXM	0009F	00000	0080A	00040	20004	254
029A2	XXM	0009F	00000	0080A	00040	20004	410
029A2	XXM	0009F	00000	0080A	00040	20004	413
029A2	XXM	0009F	00000	0080A	00040	20004	416
029A2	XXT	0009F	00000	0080A	00040	20004	410
029A2	XXT	0009F	00000	0080A	00040	20004	413
029A2	XXT	0009F	00000	0080A	00040	20004	416
029B6	XXD	0009F	00000	00809	00040	20004	414
029B6	XXD	0009F	00000	0080A	00040	20004	416
029B6	XXM	0009F	00000	00809	00040	20004	414
029B6	XXM	0009F	00000	0080A	00040	20004	416
029B6	XXT	0009F	00000	00809	00040	20004	414
029B6	XXT	0009F	00000	0080A	00040	20004	416
029CA	XXD	0009F	00000	0080A	00040	20004	412
029CA	XXM	0009F	00000	0080A	00040	20004	412
029CA	XXT	0009F	00000	0080A	00040	20004	412
029DE	XXD	0009F	00000	00809	00040	20004	410
029DE	XXD	0009F	00000	00809	00040	20004	416
029DE	XXM	0009F	00000	00809	00040	20004	410
029DE	XXM	0009F	00000	00809	00040	20004	416
029DE	XXT	0009F	00000	00809	00040	20004	410
029DE	XXT	0009F	00000	00809	00040	20004	416
029F2	XXD	0009F	00000	0080A	00040	20004	410
029F2	XXM	0009F	00000	0080A	00040	20004	410

D1	LSURL	A2	B3	C1	C3	D3	FIG	LOAD
029F2	XXT	0009F	00000	0080A	00040	20004	410	
02A00	XXD	0009F	00000	0080A	00040	20004	412	
02A00	XXM	0009F	00000	0080A	00040	20004	412	
02A00	XXT	0009F	00000	0080A	00040	20004	412	
02A0E	XXD	0009F	00000	00808	00040	20004	412	
02A0E	XXM	0009F	00000	00808	00040	20004	412	
02A0E	XXT	0009F	00000	00808	00040	20004	412	
02A1C	XXD	0009F	00000	0080A	00040	20004	410	
02A1C	XXD	0009F	00000	0080B	00040	20004	406	
02A1C	XXM	0009F	00000	0080A	00040	20004	410	
02A1C	XXM	0009F	00000	0080B	00040	20004	406	
02A1C	XXT	0009F	00000	0080A	00040	20004	410	
02A1C	XXT	0009F	00000	0080B	00040	20004	406	
02A2C	XXD	0009F	00000	00808	00040	20004	516	
02A2C	XXM	0009F	00000	00808	00040	20004	512	
02A2C	XXM	0009F	00000	00808	00040	20004	516	
02A2C	XXT	0009F	00000	00808	00040	20004	516	
02A3C	XXD	0009F	00000	00808	00040	20004	509	
02A3C	XXM	0009F	00000	00808	00040	20004	509	
02A3C	XXT	0009F	00000	00808	00040	20004	509	
02A9E	XXM	0009F	00000	0086A	00040	20004	216	
02A9E	XXM	0009F	00000	0086A	00040	20004	254	

5-7. MXR FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions that cause the following conditions:

- 1) An error stop or loop condition with the D1 display equal to 00000 through 001E8 after a successful load from a device connected to the Multiplexer Channel, or
- 2) An error stop or loop condition during the Multiplexer Channel Test portion of the DMR program after a successful load from any channel.

NOTE

Data in the MXR formatted list is not applicable if the list was referenced as a result of a successful load on the Selector Channel after an unsuccessful load attempt on the Multiplexer Channel. Malfunction isolation must be performed using the source code data and remarks in the program listing (Section 6), and conventional troubleshooting techniques.

To utilize this data, perform the following steps:

- Step 1. Record print code (PC) specified in operating instructions for use in MXR formatted list.
- Step 2. Record hexadecimal values observed in D1, A4, A5, B4, C4, C5, D3, D4, D5, and D2 displays.
- Step 3. Construct LSURL field by means of the following:
 - a) Record an X in left-most L position to designate successful load.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) What loading device was used? If Selector Channel tape unit, record a T in U position; if Selector Channel disc unit, record a D in U position; if Multiplexer Channel device, record an M in U position.
- Step 4. Locate corresponding values in MXR formatted list by first matching D1 display value with D1 in list. Then match specified print code with PC in list. Next match constructed LSURL field with LSURL column in list. Then match A4 display value with A4 in list, A5 display value with A5 in list, etc., ignoring any blank columns.

NOTE

The control unit and device numbers may appear in second and third digits (from left) of A4 display. If this occurs, substitute actual site control unit and device numbers in corresponding digit positions of A4 column in list and proceed with matching.

- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5. Then replace specified card(s).

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
00000	X M X						20004		00000	AAAA	509	0
00000	X M X	00000		00000	00000	3F010	20044	00000	00000	0211	414	0
00000	X M X	00000		00038	00000	3F010	20000	00000	00000	0000	418	0
00000	X M X	00000		00038	00000	3F010	20000	00000	00000	2418	406	0
00000	X M X	00000		00038	00000	3F010	20000	00000	00000	2418	409	0
00000	X M X	00000		00038	00000	3F010	20000	00000	00000	2467	413	0
00000	X M X	00000		00038	00000	3F010	20001	00000	00000	2418	409	0
00000	X M X	00000	00000	00038	00000	3F010	20000	00000	00000	2467	413	0
00000	X M X	0C000	00000	00000	00000	3F010	20044	00400	00000	0211	213	0
00000	X M X	0C000	00000	00038	00000	3F010	20000	00400	00000	AAAA	504	0
00000	X M X	0C000	00000	00038	00000	3F010	20004	00400	00000	AAAA	504	0
00000	X M X	0C100	00000	00038	00000	3F010	20000	00400	00000	AAAA	509	0
00000	X M X	0C100	00000	00038	00000	3F010	20004	00400	00000	AAAA	509	0
00001	X M X	00000		00000	00000	3F010	00018	00000	00000	0002	405	0
00001	X M X	00000		00038	00000	3F010	20000	00000	00000	0001	418	0
00001	X M X	08000	02500	00000	00000	3F010	00020	00000	00000	0000	651	0
00001	X M X	08000	02500	00000	00000	3F010	00020	00000	00000	0000	653	0
00001	X M X	08000	02500	00000	00000	3F010	00020	00000	00000	0DE1	609	0
00001	X M X	08000	02500	00000	00000	3F010	00020	00000	00000	0DE1	653	0
00001	X M X	08000	02500	00000	00000	3F010	00024	00000	00000	0000	610	0
00001	X M X	08000	02500	00000	00000	3F010	00024	00000	00000	0000	620	0
00001	X M X	08000	02500	00000	00000	3F010	00024	00000	00000	0000	654	0
00001	X M X	08000	02500	00004	00000	3F010	00024	00000	00000	0000	610	0
00001	X M X	0C100	00000	00000	00000	3F010	20000	00400	00000	0200	503	0
00001	X M X	0C100	00000	00000	00000	3F010	20000	00400	00000	0200	509	0
00004	XXM	00000		00004	00000	3F010	20000	00000	00000	0000	507	0
00004	XXM	00000		00004	00000	3F010	20000	00000	00000	0000	508	0
00004	XXM	00000	00000	00000	00000	3F010	20000	00000	00000	0000	506	0
00004	XXM	00000	00000	00004	00000	3F010	20000	00000	00000	0000	203	0

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
00004	XXM	00000	00000	00004	00000	3F010	20000	00000	00000	0000	506	0
00004	XXM	00000	00000	00004	00000	3F010	20000	00000	00000	0000	518	0
00004	XXM	09400	00000	00004	00000	3F010	20000	10400	00000	0008	245	0
00004	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0000	504	0
00004	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0000	505	0
00004	XXM	0C100		00004	00000	3F010	20000	00400	00000	0000	507	0
00004	XXM	0C100	00000	00004	00000	3F010	20000	00000	00000	0000	502	0
00004	XXM	0C100	00000	00004	00000	3F010	20000	00000	00000	0000	503	0
00004	XXM	0C100	00000	00004	00000	3F010	20000	00400	00000	0000	217	0
00004	XXM	0C100	00000	00004	00000	3F010	20000	00400	00000	0000	506	0
00004	XXM	0C100	00000	00004	00000	3F010	20000	00400	00000	0000	510	0
00004	XXM	0C400		00004	00000	3F010	20000	00000	00000	0000	292	0
00004	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0000	161	0
00004	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0000	204	0
00004	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0000	209	0
00004	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0000	288	0
00004	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0000	292	0
00004	XXM	0C500	00000	00004	00000	3F010	20000	00400	00000	0000	291	
00005	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0000	204	0
00006	X M X	0C200	00000	00000	00000	3F010	20000	00400	00000	0000	216	0
00007	X M X	00000	00000	00004	00000	3F010	20040	00488	00000	0000	301	0
00007	X M X	00000	00000	00008	00000	3F010	20040	00488	00000	0000	307	0
00011	X M X	08000	00000	00000	00000	3F018	20000	00000	00800	0888	509	0
00015	XXM	0C400	00000	00005	00000	3F018	20004	00001	00100	069C	312	0
00044	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0090	323	0
00048	X M X	0C400	00000	1800C	00010	3F010	20004	00410	08000	048C	305	0
0004C	X M X	08000	00000	00000	00000	3F018	20040	00000	00100	0484	286	0
00052	X M X	000C2	00000	00000	00000	01010	00800	00000	00000	0011	401	0
00054	XXM	08000	00040	00004	00000	3F018	00020	00000	00000	0000	255	0
00054	XXM	0C500	00000	00004	00000	3F010	20004	00400	00000	0850	251	0
00064	X M X	0C100	00000	00038	00000	00710	20040	00400	00000	0000	500	0

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
00094	X M X	0C400	00000	00000	00000	3F010	00000	00000	00000	0093	402	0
00080	X M X	0C120		0002A	0002A	3F010	00048	10000	00000	0001	503	0
001B8	XXM						20000		00100	0000	503	0
001B8	XXM	00000		00004	00000	3F010	00000	00000	00000	0000	411	0
001B8	XXM	00000	0C500	00004	00000	3F010	20000	00000	00000	0000	411	0
001B8	XXM	08000	00000	00004	00000	3F018	00020	00000	00100	0000	509	0
001B8	XXM	08000	00000	00004	00000	3F018	00020	00000	00100	0000	511	0
001B8	XXM	08000	00000	00004	00000	3F018	20000	00100	00100	0000	505	0
001B8	XXM	08000	00000	00004	00000	3F018	20000	00400	00100	0000	252	0
001B8	XXM	08000	00000	00004	00000	3F018	20000	00400	00100	0000	503	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	605	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	616	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	617	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	618	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	651	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	652	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	653	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0000	655	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0002	653	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	605	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	608	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	610	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	613	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	615	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	616	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	652	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	654	0
001B8	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	5558	655	0
001B8	XXM	08000	02500	00004	00002	3F010	00020	00000	00000	5558	604	0
001B8	XXM	08000	02500	00004	3F010	00000	00020	0000	00000	5558	624	0
001B8	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0000	215	0
001B8	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0000	505	0
001B8	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0F0F	210	0

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
001B8	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0F0F	212	0
001B8	XXM	0C100		00004	00000	3F010	20000	00000	00000	0000	417	0
001B8	XXM	0C100		00004	00000	3F010	20000	00400	00000	0000	419	0
001B8	XXM	0C100	00000	00004	00000	3F010	20000	00400	00000	0000	502	0
001B8	XXM	0C100	00000	00004	00000	3F010	20000	00400	00000	0F0F	614	0
001B8	XXM	0C100	00000	00004	00000	3F010	20000	00400	00000	0F0F	624	0
001B8	XXM	0C100	00000	00004	00000	3F010	20004	00000	00000	5020	506	0
001B8	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0F0F	310	0
001B8	XXM	0C500	00000	00004	00000	3F010	20000	00000	00000	0000	252	0
001B8	XXM	0C500	00000	00004	00000	3F010	20000	00400	00000	0000	255	0
001B9	XXM	00000		00004	00000	3F010	20000	00000	00000	F000	414	0
001B9	XXM	00000		00004	00000	3F010	20000	00000	00000	FF00	413	0
001B9	XXM	00000	00000	00004	00000	3F010	20000	00000	00000	FF00	413	0
001B9	XXM	08000	00000	00004	00000	3F00C	20000	00400	00000	0000	293	0
001B9	XXM	08000	02500	00004	00000	3F010	00020	00000	00000	0043	315	0
001B9	XXM	0C100		00004	00000	3F010	20000	00400	00000	FF00	417	0
001B9	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	F000	246	0
001B9	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	FF00	413	0
001B9	XXM	0C500	00000	00004	00000	3F010	20000	10000	00000	0000	291	0
001BC	X M X	0C200	00000	00000	00000	3F010	20000	00400	00000	01B8	295	0
0020B	X M X	0C200	00000	00000	00000		20000	00200	00000	550D	314	F
03058	X M X	00300	00000	0200C	00018	06010	20000	00480	08000	0080	105	
03058	X M X	00300	00000	0200C	00018	2D010	20000	00480	08000	0080	105	
03058	X M X	08000	00000	0000C	00000	00010	20000	00498	08000	0080	115	
03058	X M X	08000	00000	0000C	00000	00010	20000	00498	08000	0080	160	
03058	X M X	08000	00000	0000C	00000	3F010	20000	00498	08000	0080	113	
03058	X M X	08000	00000	0000C	00000	3F010	20000	00498	08000	0080	115	
03058	X M X	08000	00000	0000C	00000	3F010	20000	00498	08000	0080	271	

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
03058	X	M	X	08000	00000	0000C	00010	0E010	20000	00490	08000	0080 115
03058	X	M	X	08000	00000	0000C	00010	38010	20000	00490	08000	0080 160
03058	X	M	X	08000	00000	0000C	00010	3F010	20000	00490	08000	0080 113
03058	X	M	X	08000	00000	0000C	00010	3F010	20000	00490	08000	0080 115
03058	X	M	X	08000	00000	0000C	00010	3F010	20000	00490	08000	0080 151
03058	X	M	X	08000	00000	0000C	00010	3F010	20000	00490	08000	0080 160
03058	X	M	X	08000	00000	0000C	00012	3F018	20000	00404	08000	0080 113
03058	X	M	X	08000	00004	0144E	00012	3F018	20000	00484	08000	0080 105
03058	X	M	X	08000	30000	0000C	00000	00010	20000	00498	08000	0080 160
03060	X	M	X	00000	00000	0008A	00014	3F006	0180E	14000	00040	FFF8 309 9
03060	X	M	X	02500	02500	00000	00000	3F806	20007	00000	00041	305C 120
03060	X	M	X	02500	02500	00000	00000	3F806	20007	00000	00041	305C 120 1
03060	X	M	X	02500	02500	00000	00000	3F806	20007	00000	00041	305C 122 1
03060	X	M	X	02500	02500	00000	00000	3F906	20007	00000	00041	305C 123
03060	X	M	X	02500	12500	00000	00000	2F806	20007	00000	00041	305C 122
03060	X	M	X	08000	00000	00000	00000	3F00C	20007	00400	00000	305C 116 5
03060	X	M	X	08000	00004	0008A	00012	3F001	20804	00400	00000	305C 311
03060	X	M	X	08000	0D200	00000	00000	3F010	20000	00400	00000	305C 119
03060	X	M	X	08000	0D200	00000	00000	3F090	20000	00400	00000	305C 119
03060	X	M	X	08000	0E800	00000	00000	3F00C	20007	00400	00000	305C 118
03060	X	M	X	08000	0E800	00000	00000	3F00C	20007	00400	00000	305C 118 4
03060	X	M	X	08000	0E800	00000	00000	3F00C	20007	00400	00000	305C 116 5
03060	X	M	X	0BE00	0FE00	0108A	00814	2A006	00004	00404	00080	30F4 105
03060	X	M	X	0C400	02500	00000	00000	3F886	20007	00000	00041	305C 115
03060	X	M	X	0C400	0C400	00000	00000	00006	20007	00000	00041	305C 122
03060	X	M	X	0C400	0C400	00000	00000	00006	20007	00000	00041	305C 123
03060	X	M	X	0C400	0C400	00000	00000	00006	20007	00000	00041	305C 116 1
03060	X	M	X	0C400	0C400	00000	00000	00006	20007	00000	00041	305C 119 1
03060	X	M	X	0C400	0C400	00000	00000	01006	20007	00000	00041	305C 119 1
03060	X	M	X	0C400	0C400	00000	00000	03006	20007	00000	00041	305C 119
03060	X	M	X	0C400	0C400	00000	00000	03006	20007	00000	00041	305C 123
03060	X	M	X	0C400	0C400	00000	00000	03006	20007	00000	00041	305C 119 1
03060	X	M	X	0C400	0C400	00000	00000	07006	20007	00000	00041	305C 119

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
03060	X	M	X	0C400	0C400	00000	00000	07006	20007	00000	00041	305C 122
03060	X	M	X	0C400	0C400	00000	00000	07006	20007	00000	00041	305C 123
03060	X	M	X	0C400	0C400	00000	00000	0F006	20007	00000	00041	305C 119
03060	X	M	X	0C400	0C400	00000	00000	2B006	20007	00000	00041	305C 122
03060	X	M	X	0C400	0C400	00000	00000	2F006	20007	00000	00041	305C 119
03060	X	M	X	0C400	0C400	00000	00000	37006	20007	00000	00041	305C 119
03060	X	M	X	0C400	0C400	00000	00000	3B006	20007	00000	00041	305C 119
03060	X	M	X	0C400	0C400	00000	00000	3D006	20007	00000	00041	305C 119 1
03060	X	M	X	0C400	0C400	00000	00000	3F006	20007	00000	00041	305C 119
03060	X	M	X	0C400	0C400	00000	00000	3F006	20007	00000	00041	305C 120
03060	X	M	X	0C400	0C400	00000	00000	3F006	20007	00000	00041	305C 122
03060	X	M	X	0C400	0C400	00000	00000	3F006	20007	00000	00041	305C 123
03060	X	M	X	0C400	0C400	00000	00000	3F006	20007	00000	00041	305C 116 1
03060	X	M	X	0C400	0C400	00000	00000	3F006	20007	00000	00041	305C 119 1
03060	X	M	X	0C400	0C400	00000	00000	3F046	20007	00000	00041	305C 122
03060	X	M	X	0C400	0C400	00000	00000	3F046	20007	00000	00041	305C 116 1
03060	X	M	X	0C400	0C400	00000	00000	3F106	20007	00000	00041	305C 122
03060	X	M	X	0C400	0C400	00000	00000	3F106	20007	00000	00041	305C 116 1
03060	X	M	X	0C400	0C400	00000	00000	3F186	20007	00000	00041	305C 120
03060	X	M	X	0C400	0C400	00000	00000	3F806	20007	00000	00041	305C 120
03060	X	M	X	0C400	0C400	00000	00000	3F806	20007	00000	00041	305C 123
03060	X	M	X	0C400	0C400	00000	00000	3F846	20007	00000	00041	305C 122
03060	X	M	X	0C400	0C400	00000	00000	3F906	20007	00000	00041	305C 123
03060	X	M	X	0C400	0C400	00000	00000	3F986	20007	00000	00041	305C 120
03060	X	M	X	0C400	0C400	00000	00000	3F986	20007	00000	00041	305C 123
03060	X	M	X	0C400	0C400	00000	00000	3FC06	20007	00000	00041	305C 123
03060	X	M	X	0C400	3C400	00000	00000	00006	20007	00000	00041	305C 123
03060	X	M	X	0C500	0C500	00000	00000	3F846	20007	00000	00041	305C 120
03060	X	M	X	0D500	0D500	00000	00000	3F846	20007	00000	00041	305C 122
03060	X	M	X	0D600	0D600	00000	00000	3F046	20007	00000	00041	305C 120
03060	X	M	X	0E300	0E300	00000	00000	3F846	20007	00000	00041	305C 122
03060	X	M	X	11700	01700	00000	00000	3F006	20007	00000	00000	305C 103 5

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
03060	X M X	12700	02700	00000	00000	3F006	20007	00000	00000	305C	103	5
03060	X M X	13300	03300	00000	00000	3F006	20007	00000	00000	305C	103	5
03060	X M X	13500	03500	00000	00000	3F006	20007	00000	00000	305C	103	5
03060	X M X	13600	03600	00000	00000	3F006	20007	00000	00000	305C	103	5
03060	X M X	13F00	03F00	00000	00000	3F006	20007	00000	00000	305C	103	5
03060	X M X	1B700	0B700	00000	00000	3F006	20007	00000	00000	305C	103	5
03060	X T X	08000	0E800	00000	00000	3F00C	20007	00400	00000	305C	512	5
03068	X M X	0C400	0C400	00000	00000	3F006	20007	00000	00041	305C	160	
03068	X M X	0C400	2C400	00000	00000	00006	20007	00000	00041	305C	122	
0307C	X D X						20007			3078	608	6
0307C	X D X						20007			3078	608	7
0307C	X D X						20007			3078	608	8
0307C	X D X	08000	04000	00000	00000		20007		00100	3078	608	7
0307C	X T X						20007			3078	608	6
0307C	X T X						20007			3078	608	7
0307C	X T X						20007			3078	608	8
0307C	X T X	08000	04000	00000	00000		20007		00100	3078	608	7
0307E	XXM	08000	00000	00004	00000	3F010	20000	00000	00030	35DE	106	
0307E	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	35DE	121	
0307E	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	396E	249	8
0307E	XXM	08000	04700	00004	00000	3F010	20000	00400	00000	396E	245	9
0307E	XXM	08000	04B00	00004	00000	3F010	20004	00400	00000	3824	103	6
0307E	XXM	08000	0C400	00004	00000	3F010	20000	00000	00000	35DE	103	1
0307E	XXM	08000	0C440	00004	00000	3F010	20000	00000	00080	014C	106	
0307E	XXM	08000	0E800	00004	00000	3F010	20000	00400	00000	374E	121	
0307E	XXM	08000	0E800	00004	00000	3F010	20000	00400	00000	374E	105	4
0307E	XXM	08000	0E800	00004	00000	3F010	20000	00400	00000	374E	107	4
0307E	XXM	08000	0E800	00004	00000	3F010	20000	00400	00000	374E	121	4
0307E	XXM	08000	0E800	00004	00000	3F010	20000	00400	00000	3F4E	107	4
0307E	XXM	08000	0E800	00004	00000	3F010	20004	00400	00004	3774	118	4

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
0308A	XXM	08000	04700	00004	00000	3F010	20000	00400	00000	396E	313	9
030CC	XXD	00000	07F00	00004	00000	3F010	20004	00000	00010	30C8	215	E
030CC	XXD	00000	0E800	00004	00000	3F010	20004	00000	00000	30C8	209	C
030CC	XXM	00000	03700	00004	00000	3F010	20004	00000	00000	30C4	278	E
030CC	XXM	00000	03700	00004	00000	3F010	20004	00000	00000	30C8	313	E
030CC	XXM	00000	03700	00004	00000	3F010	20004	00000	00000	30C8	323	E
030CC	XXM	00000	07F00	00004	00000	3F010	20004	00000	00010	30C8	215	E
030CC	XXM	00000	0E800	00004	00000	3F010	20004	00000	00000	30C8	209	C
030CC	XXM	00000	0E800	00004	00000	3F018	20004	00000	00000	30C8	225	C
030CC	XXT	00000	07F00	00004	00000	3F010	20004	00000	00010	30C8	215	E
030CC	XXT	00000	0E800	00004	00000	3F010	20004	00000	00000	30C8	209	C
030D0	XXM	00000	02540	00004	00000	3F010	20004	00000	00000	30CC	211	B
030E0	XXM	00000	02500	00004	00000	3F018	00024	00000	00000	30DC	212	B
030E0	XXM	08000	00200	00005	00000	3F010	20004	00401	00000	30DC	308	
030E0	XXM	08000	08000	00005	00000	3F010	20004	00401	00010	30DC	307	
0317A	XXM	08000	0BE20	00004	00000	3F010	20000	00400	00010	3446	104	
0317A	XXM	08000	0DE20	00004	00000	3F010	20000	00000	00010	3446	104	
0317A	XXM	08000	0DE20	00004	00000	3F010	20000	00400	00010	3446	104	
0317A	XXM	08000	0EE20	00004	00000	3F010	20000	00400	00010	3446	104	
031B0	X M X	08000	00000	00001	00012	3F018	00000	00000	00100	0038	113	
031B8	XXM	00000	00004	00005	00000	3F001	20000	00401	00000	0080	113	
031B8	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	0080	106	
031B8	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	0080	113	
031CC	XXM	0C400	00000	00004	00000	3F010	20004	00400	00000	01C8	511	
031D0	XXM	08000	00000	00004	00000	3F018	20004	00400	00000	31CC	105	
031D0	XXM	08000	00000	00004	00000	3F018	20004	00400	00000	31CC	107	
031D0	XXM	08000	00000	00004	00000	3F018	20004	00400	00000	31CC	113	
031D0	XXT	08000	00000	00004	00000	3F018	20004	00000	00100	31CC	214	
031D8	XXM	08000	00000	00004	00000	3F000	20004	00400	00000	31D4	104	

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
031D8	XXM	08000	00000	00004	00000	3F010	20004	00400	00000	31D4	104	
031D8	XXM	08000	00000	00004	00000	3F010	20004	00400	00000	31D4	278	
031E8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	000D	105	
031E8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	000E	105	
031E8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	000E	107	
031E8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	000E	121	
031E8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	001C	105	
031E8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	001C	107	
031E8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	008C	105	
031E8	XXM	08000	00001	00004	00000	3F018	20000	00400	00000	000D	107	
031E8	XXM	08000	00002	00004	00000	3F018	20000	00400	00000	000E	107	
031E8	XXM	08000	00002	00004	00000	3F018	20000	00400	00000	000E	121	
031E8	XXM	08000	00010	00004	00000	3F018	20000	00400	00000	008C	107	
031E8	XXM	08000	00020	00004	00000	3F018	20000	00400	00000	0002	104	
031E8	XXM	08000	00020	00004	00000	3F018	20000	00400	00000	0002	278	
031E8	XXM	08000	08000	00004	00000	3F018	20000	00400	00000	000E	107	
031E8	XXM	0800B	00000	00004	00000	3F018	3C000	00000	00000	000B	310	
031F8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	0008	105	
031F8	XXM	08000	00000	00004	00000	3F018	20000	00400	00000	000C	288	
031F8	XXM	08000	00000	00004	00000	3F018	20004	00400	00000	0004	105	
031F8	XXT	08000		00004	00000	3F018	20000	00000	00000	0000	512	
031F8	XXT	08000	00000	00004	00000	3F018	20000	00000	00000	0000	214	
03228	XXD	08000	00000	00004	00000	3F018	20000	00000	00000	D124	215	
03228	XXM	08000	00000	00004	00000	3F018	20000	00000	00000	D124	215	
03228	XXT	08000	00000	00004	00000	3F018	20000	00000	00000	D124	215	
0322C	XXT	08000		00004	00000	3F018	20004	00000	00000	CYCL	518	
0326E	XXM	08000	00020	00004	00000	3F018	20004	00400	00000	326A	104	
032C0	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	0080	104	
032C0	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	0080	107	
032C8	XXM	08000	00000	00004	00000	3F00C	20004	00400	00000	32C4	278	

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
032C8	XXM	08000	00000	00004	00000	3F018	20004	00400	00100	3234	273	
032C8	XXM	08000	00000	00004	00000	3F018	20004	00400	00100	32C4	278	
032C8	XXM	08000	00040	00004	00000	3F018	20004	00400	00000	32C4	105	
032C8	XXM	08000	00040	00004	00000	3F018	20004	00400	00000	32C4	274	
032D4	XXM	08000	00040	00004	00000	3F018	20004	00400	00000	32D0	106	
032D4	XXM	08000	00040	00004	00000	3F018	20004	00400	00000	32D0	107	
032D4	XXM	08000	00044	00004	00000	3F018	20004	00400	00000	32D0	107	
032D4	XXM	08000	00046	00004	00000	3F018	20004	00400	00000	32D0	107	
03328	XXM	08000	00000	00004	00000	3F010	20004	00400	00000	3324	106	
03330	XXM	08000	00040	00004	00000	3F018	20004	00400	00100	332C	107	
03330	XXM	08000	00040	00004	00000	3F018	20004	00400	00100	332C	274	
03330	XXM	08000	00040	00004	00000	3F018	20004	00400	00100	332C	309	
03330	XXM	08000	00040	00004	00000	3F018	20004	00400	00100	332C	310	
03330	XXT	08000	00040	00004	00000	3F018	20004	00000	00100	332C	513	
03396	XXM	08000	00040	00004	00000	3F010	20004	18000	00000	0004	306	
03396	XXT	08000	00040	00004	00000	3F010	20004	18000	00000	0004	210	
033A6	XXM	08000		00004	00000	3F010	20000	00400	00000	0114	211	
033A6	XXM	08000	00040	00004	00000	3F010	00000	00400	00000	0114	153	
033A6	XXM	08000	00040	00004	00000	3F010	00000	00400	00000	0114	293	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00000	00000	0114	255	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00000	00000	0114	306	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00000	00000	0114	322	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	107	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	121	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	211	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	243	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	248	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	249	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	306	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	310	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	314	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0118	306	
033A6	XXM	08000	00040	00004	00000	3F010	20000	00400	00004	0114	118	4
033A6	XXM	08000	00040	00004	00000	3F010	20000	08400	00000	0118	306	
033A6	XXM	08000	00040	00004	00000	3F010	24000	00400	00000	011A	244	

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
033A6	XXM	08000	00040	00004	00000	3F010	28000	00400	00000	0114	244	
033A6	XXM	08000	00040	00004	00000	3F010	30000	00400	00000	0114	243	
033A6	XXM	08000	00040	00004	00000	3F010	30000	00400	00000	0114	315	
033A6	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0114	272	
033A6	XXM	0C000	00000	00004	00000	3F010	20000	00400	00000	0114	278	
033A6	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0114	294	
033A6	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0114	311	
033A6	XXM	0DC00	00040	00004	00000	3F010	20000	00400	00000	0114	294	
033A6	XXM	0DC00	00040	00004	00000	3F010	20000	00400	00000	0114	311	
033A6	XXT	08000		00004	00000	3F010	20000	00400	00000	0114	512	
033A6	XXT	08000	00040	00004	00000	3F010	20000	00000	00000	0114	211	
033A6	XXT	08000	00040	00004	00000	3F010	20000	00000	00000	0114	515	
033AC	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0114	315	
033B2	XXT	08000	00040	00004	00000	3F010	20004	00400	00000	33CE	213	
033B6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	30F5	315	
033B6	XXM	08000	00040	00004	00000	3F010	20000	18400	00000	30F4	323	
033B6	XXT	08000	00040	00004	00000	3F010	20000	00400	00000	30F5	512	
033C6	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	0000	106	
033C6	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	0000	107	
033C6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0000	105	
033C6	XXM	08000	00040	00004	00000	3F010	20000	00400	00000	0000	121	
033C6	XXM	08000	00040	00004	00000	3F010	20000	00400	00010	0000	106	
033D2	XXM	08400	00040	00004	00000	3F010	20004	00400	00000	33CE	273	
033D6	XXM	08000	00040	00004	00000	3F00C	20004	00400	00080	33D2	106	
033D6	XXM	08000	00040	00004	00000	3F00C	20004	00400	00080	33D2	113	
033D6	XXM	08000	00040	00004	00000	3F018	20004	00400	00080	33D2	115	
033D6	XXM	08000	00040	00004	00000	3F018	20004	00400	00100	33D2	273	
033D6	XXM	08000	00040	00004	00000	3F018	20004	00400	00100	33D2	278	
033D6	XXM	08000	00040	00004	00000	3F018	20004	00400	00180	33D2	106	
033D6	XXM	08000	00060	00004	00000	3F018	20004	00400	00000	33D2	104	
033D6	XXM	10000	00044	0000C	00012	3F001	20004	00400	00000	33D2	105	
033D6	XXM	10000	00044	0000C	00012	3F001	20004	00400	00000	33D2	106	

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
033D6	XXT	08000	00040	00004	00000	3F010	20004	00400	00000	33D2	515	
033D6	XXT	08000	00040	00005	00000	3F010	20004	00401	00000	33D2	515	
033EB	X T X	00033		0002A	00000	3F010	0C028	10000	00000	3133	402	
03404	XXM	08000		00004	00000	3F010	20000	00400	00010	0114	249	
03404	XXM	08000	00000	00004	00000	3F010	20000	00400	00010	0114	246	
03404	XXM	08000	00020	00004	00000	3F010	20000	00400	00010	0114	311	
03404	XXM	08000	00020	00004	00000	3F010	20000	00400	00010	0114	312	
03426	XXM	08000	00060	00004	00000	3F018	20004	00400	00000	3422	104	
0344A	XXT	08000		00004	00000	3F010	20004	00400	00000	3446	518	
0345E	XXM	08000	00000	00004	00000	2F010	20000	00400	00000	4000	107	
0345E	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	4000	106	
0345E	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	4000	107	
0345E	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	4000	113	
0345E	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	4000	311	
0345E	XXM	08000	00100	00004	00000	3F010	20000	00400	00000	4000	105	
0345E	XXM	08000	03000	00004	00000	3F010	20000	00400	00000	4000	304	
0345E	XXM	08000	07E00	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	07E00	00004	00000	3F010	20000	00400	00000	4000	278	
0345E	XXM	08000	08100	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	0BE00	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	0BE00	00004	00000	3F010	20000	00400	00000	4000	104	
0345E	XXM	08000	0BE00	00004	00000	3F010	20000	00400	00000	4000	272	
0345E	XXM	08000	0BE00	00004	00000	3F010	20000	00400	00000	4000	278	
0345E	XXM	08000	0BF00	00004	00000	3F010	20000	00400	00000	4000	105	
0345E	XXM	08000	0DE00	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	0DE00	00004	00000	3F010	20000	00400	00000	4000	272	
0345E	XXM	08000	0DE00	00004	00000	3F010	20000	00400	00000	4000	278	
0345E	XXM	08000	0DF00	00004	00000	3F010	20000	00400	00000	4000	105	
0345E	XXM	08000	0EE00	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	0EE00	00004	00000	3F010	20000	00400	00000	4000	272	
0345E	XXM	08000	0EE00	00004	00000	3F010	20000	00400	00000	4000	278	
0345E	XXM	08000	0EF00	00004	00000	3F010	20000	00400	00000	4000	105	
0345E	XXM	08000	0F600	00004	00000	3F010	20000	00400	00000	4000	103	

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
0345E	XXM	08000	0FA00	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	0FB00	00004	00000	3F010	20000	00400	00000	4000	105	
0345E	XXM	08000	0FC00	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	0FC00	00004	00000	3F010	20000	00400	00000	4000	119	
0345E	XXM	08000	0FD00	00004	00000	3F010	20000	00400	00000	4000	105	
0345E	XXM	08000	0FE00	00004	00000	3F010	20000	00400	00000	4000	105	
0345E	XXM	08000	0FE00	00004	00000	3F010	20000	00400	00000	4000	106	
0345E	XXM	08000	0FF00	00004	00000	3F010	20000	00400	00000	4000	103	
0345E	XXM	08000	0FF00	00004	00000	3F010	20000	00400	00000	4000	113	
0345E	XXM	08000	0FF00	00004	00000	3F010	20000	00400	00000	4000	272	
0345E	XXM	08000	0FF00	00004	00000	3F010	20000	00400	00000	4000	278	
03476	XXM	00000	00000	00004	00000	3F126	20004	00400	00041	3472	308	
03476	XXM	00000	00000	00004	00000	3F126	20004	00400	00041	3472	309	1
03476	XXM	08000	00000	00004	00000	3F018	20004	00400	00040	3472	121	
035AA	XXM	08000	00000	00004	00000	3F010	20000	00400	00000	0114	308	
035EA	X M X	08000	0D200	00009	00010	3F010	20000	00400	00008	3618	118	3
035EA	X M X	08000	0D200	00009	00010	3F010	20000	00400	00008	3718	107	3
035EA	X M X	08000	0D200	00009	00010	3F010	20000	00400	00008	3718	115	3
035F6	X M X	08000	0D200	00000	00000	1F090	20000	00400	00000	35CA	119	
035F6	X M X	08000	0D200	00000	00000	3E010	20000	00400	00000	35CA	119	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	103	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	105	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	106	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	115	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	119	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	122	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	123	
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	103	1
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	119	1
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	118	3
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00400	00008	35CA	121	3
035F6	X M X	08000	0D200	00000	00000	3F010	20000	00401	00008	35CA	307	3
035F6	X M X	08000	0D200	00000	00000	3F090	20000	00400	00000	35CA	119	
035F6	X M X	08000	0D200	00000	00000	3F090	20000	00400	00000	35CA	119	1
035F6	X M X	08000	0D200	00000	00000	3F2B0	20000	00400	00000	35CA	123	

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
035F6	X M X	08000	0D200	00000	00001	00000	20000	00401	00008	35CA	308	3
035F6	X M X	08000	0D300	00000	00000	3F010	20000	00400	00000	35CA	315	1
035FE	X M X	08000	0D200	00000	00000	3F010	20000	00400	00000	35CA	118	3
03630	XXM	08000	0D200	00004	00000	3F010	20004	00400	00000	362C	106	3
03648	XXM	08000	0D200	00004	00000	3F010	20004	00400	00040	3644	105	3
03648	XXM	08000	0D200	00004	00000	3F010	20004	00400	00040	3644	107	3
03648	XXM	08000	0D200	00005	00000	3F010	20004	00401	00008	3644	107	3
03648	XXM	08000	0D200	00005	00000	3F010	20004	00401	00008	3644	274	3
037AE	XXM	08000	0E800	00005	00000	3F010	20000	00401	00000	0114	115	5
03834	XXM	08000	08000	00004	00000	3F010	20000	00400	00000	704F	103	6
03844	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	F047	103	6
03844	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	F04D	103	6
03844	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	F04E	103	6
03844	XXM	08000	0F000	00004	00000	3F030	20000	00400	00000	F0F0	120	6
03856	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	F05F	103	6
03856	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	F06F	103	6
03856	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	F0CF	103	6
03856	XXM	08000	04100	00004	00000	3F010	20000	00400	00000	F14F	103	6
03856	XXM	08000	04200	00004	00000	3F010	20000	00400	00000	F24F	103	6
03856	XXM	08000	04400	00004	00000	3F010	20000	00400	00000	F44F	103	6
038BC	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	C54B	103	7
038BC	XXM	08000	04000	00004	00000	3F010	20000	00400	00000	C54E	103	7
038BC	XXM	08000	05000	00004	00000	3F010	20000	00400	00000	D54A	103	6
038BC	XXM	08000	06000	00004	00000	3F010	20000	00400	00000	E54A	103	7
03908	XXM	08000	00500	00004	00000	3F010	20004	00400	00000	3904	103	8
03A26	XXM	00000	02544	00004	00000	3F018	20000	00400	00000	3BDE	115	B
03AC6	X M X	04000	04000	0008A	00020	3F006	01800	08600	00040	3A00	304	E
03AC6	X M X	04000	04000	0008A	00020	3F006	01800	08600	00040	3A00	313	E

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
03AC6	X M X	04000	04000	0008A	00020	3F006	01800	08600	00040	3A00	314	F
03AC6	X M X	04000	04000	0008A	00020	3F006	01802	08600	00040	3A00	304	E
03AC6	X M X	04000	04000	0008A	00020	3F006	01802	08600	00040	3A00	314	F
03AC6	X M X	10000	02544	0004A	00012	3F001	20000	00400	00000	3AC2	311	B
03B08	XXM	10000	02544	0000C	00012	3F001	20000	00400	00000	0000	307	B
03B12	XXD	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	210	B
03B12	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	210	B
03B12	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	310	B
03B12	XXT	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	210	B
03B13	XXT	00000		00004	00000	3F010	20004	00000	00000	B000	503	
03B1E	XXD	00000	00000	00004	00000	3F010	20000	00000	00000	3C6C	213	B
03B1E	XXD	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	213	B
03B1E	XXM	00000		00004	00000	3F010	20000	00000	00000	3C6C	211	B
03B1E	XXM	00000	00000	00004	00000	3F010	20000	00000	00000	3C6C	213	B
03B1E	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	212	B
03B1E	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	213	B
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00000	414C	274	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00000	414C	315	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00000	416C	278	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00000	416C	323	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00000	41C0	243	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00000	41C0	248	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00000	41C0	315	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00010	4128	244	E
03B1E	XXM	00000	07F00	00004	00000	3F010	20004	00000	00010	4128	248	E
03B1E	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00000	416C	274	E
03B1E	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	4128	244	E
03B1E	XXT	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	213	B
03B36	XXM	00000	02540	00004	00000	3F010	20000	00400	00000	3C6C	313	B
03B36	XXM	10000	025D0	0000C	00012	3F001	20000	00400	00000	3C6C	313	B

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
03B44	XXD	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	210	B
03B44	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	210	B
03B44	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	248	B
03B44	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	249	B
03B44	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	313	B
03B44	XXT	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	210	B
03B50	XXM	00000	02540	00004	00000	3F010	20000	00000	00000	3C6C	315	B
03B50	XXM	10C00	02540	00004	00000	3F010	20000	00000	00000	3C6C	311	B
03BE2	XXD	00000	02540	00004	00000	3F010	20004	00000	00000	3BEE	215	B
03BF2	XXM	00000	02540	00004	00000	3F010	20004	00000	00000	3BEE	215	B
03BF2	XXT	00000	02540	00004	00000	3F010	20004	00000	00000	3BEE	215	B
03C38	XXM	08000	02540	00005	00000	3F010	20000	00401	00000	0000	106	B
03C38	XXM	08000	02540	00005	00000	3F010	20000	00401	00000	0000	272	B
03C38	XXM	08000	02540	00005	00000	3F010	20000	00401	00000	0000	294	B
03C6C	XXD	00000	02540	00004	00000	3F010	20004	00000	00000	3C68	515	B
03C6C	XXD	10000	02544	0000C	00012	3F001	20804	00400	00000	3C68	211	B
03C6C	XXM	00000	02540	00004	00000	3F010	20004	00000	00000	3C68	306	B
03C6C	XXM	00000	02540	00004	00000	3F010	20004	00000	00000	3C68	515	B
03C6C	XXM	10000	02544	0000C	00012	3F001	20004	18000	00000	3C68	310	B
03C6C	XXM	10000	02544	0000C	00012	3F001	20804	00400	00000	3C68	211	B
03C6C	XXM	10000	02544	0000E	00012	3F001	00004	00000	00000	FFE8	307	B
03C6C	XXT	00000	02540	00004	00000	3F010	20004	00000	00000	3C68	515	B
03C6C	XXT	10000	02544	0000C	00012	3F001	20804	00400	00000	3C68	211	B
03C8C	XXM	00000	00540	00004	00000	3F010	20004	00000	00000	3C88	106	B
03E24	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00000	3E20	105	B
03E24	XXM	00000	0FF40	00004	00000	3F010	20004	00000	00000	3E20	107	B
03FBE	XXM	08000	07F00	00004	00000	3F010	20004	00000	00010	414C	278	E
04100	XXM	00000	03700	00004	00000	3F010	20004	00000	00000	40FC	274	E
04258	X M X	10000	04000	0008A	00014	3F006	01804	10000	00040	3CF0	314	F

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
04258	X M X	10000	0E700	0008A	00014	3F006	01806	18000	00040	3CF8	314	F
04268	XXM	00000	03700	00004	00000	3F010	20004	00000	00000	4264	310	F
04274	XXM	00000	00000	00004	00000	3F126	20004	00000	00041	4270	312	E
04274	XXM	00000	04000	00004	00000	3F010	20004	00000	00000	4270	248	E
04274	XXM	00000	04000	00004	00000	3F010	20004	00000	00000	4270	323	E
04274	XXM	00000	04000	00004	00000	3F010	20004	00000	00000	4270	315	F
04274	XXM	04000	04000	00004	00000	3F806	20004	00000	00041	4270	306	E
04280	XXM	00000	00000	00004	00000	3F126	20004	05800	00041	427C	306	E
04280	XXM	00000	0C400	00004	00000	3F010	20004	00000	00000	427C	306	E
04280	XXM	00000	0D600	00004	00000	3F010	20004	00000	00000	427C	313	E
04374	XXM	04000	04000	00004	00000	3F010	20004	00000	00000	4270	306	E
0453E	XXM	08000	0F700	08000	00000	3F010	20000	00400		4000	105	
0506E	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	0040	516	H
0506E	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	0050	209	H
0506E	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	0050	210	H
0506E	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	0050	516	H
0506E	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	00A0	407	H
0506E	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	00F0	515	H
0506E	XXD	08000	02500	00004	00000	3F010	20004	00400	00000	0050	516	H
0506E	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	0040	516	H
0506E	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	0050	209	H
0506E	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	0050	210	H
0506E	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	0050	516	H
0506E	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	00A0	407	H
0506E	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	00F0	515	H
0506E	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	0050	516	H
0506E	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	0040	516	H
0506E	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	0050	209	H
0506E	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	0050	210	H
0506E	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	0050	516	H
0506E	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	00A0	407	H

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
0506E	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	00F0	515	H
0506E	XXT	08000	02500	00004	00000	3F010	20004	00400	00000	0050	516	H
05162	XXD	08000	02500	00004	00000	3F010	20004	00400	00000	515E	515	H
05162	XXD	08000	02500	00004	00000	3F010	20004	00400	00000	515E	516	H
05162	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	515E	294	H
05162	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	515E	515	H
05162	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	515E	516	H
05162	XXT	08000	02500	00004	00000	3F010	20004	00400	00000	515E	515	H
05162	XXT	08000	02500	00004	00000	3F010	20004	00400	00000	515E	516	H
05182	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	517E	294	H
05182	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	517E	294	H
05182	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	519E	516	H
05182	XXD	08000	02500	00004	00000	3F010	20004	00400	00000	5194	516	H
05182	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	519E	516	H
05182	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	5194	516	H
05182	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	519E	516	H
05182	XXT	08000	02500	00004	00000	3F010	20004	00400	00000	5194	516	H
05216	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	7F00	294	H
05252	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	CYCL	510	H
05252	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	CYCE	217	H
05252	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	CYCL	217	H
05252	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	CYCL	294	H
05252	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	CYCL	510	H
05252	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	FF7F	506	H
05252	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	FF7F	508	H
05252	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	CYCL	510	H
0526A	X M X	0FFFF	0FF00	0004A	00020	3F003	02800	00400	00030	51C4	304	I
0529E	XXM	00000	00000	00004	00000	3F010	20004	00000	00010	5108	314	I
052AA	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	5068	248	I
052AA	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	5068	315	I
052AA	XXM	00000	0FF00	00004	00040	3F010	20004	00000	00010	5068	311	A

D1	LSURL	A4	A5	B4	C4	C5	D3	D4	D5	D2	FIG	PC
052B2	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	5068	245	I
052BA	XXM	00000	02500	00004	00000	3F010	20004	00000	00010	5068	293	I
052BA	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	5068	153	I
052BA	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	5068	293	I
052BA	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	5068	306	I
052BA	XXM	00000	0FF00	00004	00000	3F010	20004	00000	00010	5068	314	I
052BA	XXM	000FF	00000	00004	00000	3F010	20004	00000	00010	50F8	293	I
05300	XXD	08000	02500	00004	00000	3F010	20000	00400	00000	D100	516	H
05300	XXD	08000	02500	00004	00000	3F010	20004	00400	00000	4210	516	H
05300	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	D100	516	H
05300	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	4210	516	H
05300	XXT	08000	02500	00004	00000	3F010	20000	00400	00000	D100	516	H
05300	XXT	08000	02500	00004	00000	3F010	20004	00400	00000	4210	516	H
05316	XXD	08000	02500	00004	00000	3F010	20004	00400	00000	5312	513	H
05316	XXM	08000	02500	00004	00000	3F010	20004	00400	00000	5312	513	H
05316	XXT	08000	02500	00004	00000	3F010	20004	00400	00000	5312	513	H
0541F	X M X	08000	02500	00000	00000	3F010	20040	00400	00000	CYCL	226	H
05A66	XXM	0C400	00000	00004	00000	3F010	20000	00400	00000	0020	252	
15252	XXM	08000	02500	00004	00000	3F010	20000	00400	00000	CYCL	217	H

5-8. S1R FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions that cause the following conditions:

- 1) an error stop or loop condition with the D1 display equal to 00000 through 001E8 after a successful load from a device connected to Selector Channel 1, or
- 2) an error stop or loop condition during execution of the Selector Channel 1 Test (SELONE) after a successful load from any channel.

To utilize this data, perform the following steps:

- Step 1. Record hexadecimal values observed in D1, A8, B8, C1, C8, D2, and D8 displays.
- Step 2. Construct LSURL field by means of the following:
 - a) Record an X in left-most L position to designate a successful load.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) What loading device was used? If Selector Channel tape unit, record a T in U position; if Selector Channel disc unit, record a D in the U position; if Multiplexer Channel device, record an M in U position.
- Step 3. Construct LOAD field by means of the following:
 - a) Is LOAD WAIT indicator lit? If yes, record an X in L position; if no, leave L position blank.
 - b) Is LOAD NO DATA indicator lit? If yes, record an X in O position; if no, leave O position blank.
 - c) Is LOAD CHECK indicator lit? If yes, record an X in A position; if no, leave A position blank.
 - d) Is LOAD SUBSYSTEM CHECK indicator lit? If yes, record an X in D position; if no, leave D position blank.
- Step 4. Locate corresponding values in S1R formatted list by first matching D1 display value with D1 in list. Then match constructed LSURL field with LSURL column in list. Next match A8 display with A8 in list, then match B8 display value with B8 in list, etc., ignoring any blank columns. Finally, match constructed LOAD field with LOAD column in list.
- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5, Then replace specified card(s).

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
00000	X D X			0080C		02418		406	
00000	X T X			0000C		00000		408	
00000	X T X			00808		0AAAA		509	
00000	X T X			0080C		00000		418	
00000	X T X			0080C		02418		406	
00000	X T X			0080C		02418		409	
00000	X T X			0080C		02467		413	
00000	X T X			00880		00211		414	
00000	X T X			3FC31		02418		409	
00000	X T X	00000	18080	00808	20000	0AAAA	000E0	504	
00000	X T X	00000	18080	00808	20000	0AAAA	000E1	509	
00000	X T X	00000	18080	00809	20000	0AAAA	000E1	509	
00000	X T X	00000	18080	00880	20000	00211	000E0	213	
00000	XXD	0C440	18484	00000	00000	00130	00900	614	XX
00000	XXT	00000	18080	0000A	20000	00000	000E0	504	
00001	X D X			0080C		00001		418	
00001	X D X			0080C		00004		405	
00001	X D X	00000	04084	10000	20000	00020	00030	623	
00001	X M X	00000	00000	0000C	00000	00DDD	00000	212	
00001	X M X	00001	0408C	0000B	20000	00000	00000	211	
00001	X T X			00000		00DE1		653	X
00001	X T X			0080C		00001		418	
00001	X T X			0080C		00004		405	
00001	X T X			3404C		00221		650	
00001	X T X	00000	04084	10000	20000	00020	00030	623	
00001	X T X	00000	18080	1200C	20000	00200	000E1	509	
00004	XXD			00008		00000		405	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
00004	XXT			00008		00000			
00004	XXT			00008		00000		203	
00004	XXT			00008		00000		404	
00004	XXT			00008		00000		405	
00004	XXT			00008		00000		506	
00004	XXT			00008		00000		507	
00004	XXT			00008		00000		518	
00004	XXT			00009		00000		508	
00004	XXT	00000	00000	00008	00000	00000	000E0	504	
00004	XXT	00000	18080	00008	00000	00000	000E0	209	
00004	XXT	00000	18080	00008	00000	00000	000E0	505	
00004	XXT	00000	18080	0000A	00000	00000	000E1	510	
00004	XXT	00000	18080	0000B	00000	00000	000E1	502	
00004	XXT	00000	18080	00084	00000	00000	21000	502	
00005	XXD			0000A		00000		653	
00005	XXD	00000	18080	00008	00000	00000	00030	609	
00005	XXT			0000A		00000		653	
00005	XXT	00000	18080	00008	00000	000F0	000E1	609	
00011	X T X	00000	18080	0000C	00000	00888	000E1	509	
00013	X T X			0080C		00013		401	
0001C	X T X			0000E		00010		650	
0001C	X T X			0000E		00010		654	
0004C	X T X			0008F		00084		404	
001B1	XXD	00000	04004	0E009	00000	00000	00030	624	
001B8	XXD			00002		00000		656	
001B8	XXD			00020		00000		657	
001B8	XXD			0E009		00000		618	
001B8	XXD			0E009		00000		657	
001B8	XXD			0E00A		00000		604	
001B8	XXD			0E00A		00000		616	
001B8	XXD			0E00A		00000		652	
001B8	XXD			0E00A		00000		653	
001B8	XXD			0E00A		00000		654	
001B8	XXD			0E00A		00000		655	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD	
001B8	XXD			0E00A		00000		656		
001B8	XXD			0E00A		00000		657		
001B8	XXD			0E00B		00000		658		
001B8	XXD			18009		05558		616		X
001B8	XXD	00000	04004	0E009	00000	00000	00030	615		
001B8	XXD	00000	04004	0E009	00000	00000	00030	624		X
001B8	XXD	00000	04004	0E00A	00000	00000	00030	602		
001B8	XXD	00000	04004	0E00A	00000	00000	00030	611		
001B8	XXD	00000	04004	0E00A	00000	00000	00030	613		
001B8	XXD	00000	04004	0E00A	00040	00000	00030	604		
001B8	XXD	00000	04004	0E00A	20000	00000	00030	602		
001B8	XXD	00000	04004	0E00A	20000	00000	00030	608		
001B8	XXD	00000	04004	0E00A	20000	00000	00030	609		
001B8	XXD	00000	04004	0E00A	20000	00000	00030	611		
001B8	XXD	00000	04004	0E00A	20000	00000	00030	657		
001B8	XXD	00000	04014	0E009	00010	00000	00031	605		
001B8	XXD	00000	04084	0F009	20010	00000	00030	605		
001B8	XXD	304C2	04414	18009	10000	05558	00100	608		
001B8	XXD	304C2	04414	18009	10000	05558	CYCLE	605		
001B8	XXD	304C2	04414	18009	10000	05558	CYCLE	608		
001B8	XXT			00008		00000		403		
001B8	XXT			00008		00000		506		
001B8	XXT			0000A		00000		411		
001B8	XXT			0C009		10F0F		624		
001B8	XXT			0C00A		10F0F		506		
001B8	XXT			0C00A		10F0F		651		
001B8	XXT	00000	04004	0C00A	00000	10F0F	000E1	651		
001B8	XXT	00000	04084	0C009	00000	10F0F	0010C	515		X
001B8	XXT	00000	04085	18009	20000	05558	00000	616		X
001B8	XXT	00000	04085	1800A	20000	05558	00000	610		
001B8	XXT	00000	04086	0C009	00000	10F0F	0010C	612		
001B8	XXT	00000	04086	0C009	00000	10F0F	0010C	614		
001B8	XXT	00000	0409F	18009	20000	05558	00000	616		X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
001B8	XXT	00000	04186	0C009	00000	10F0F	0010C	614	
001B8	XXT	00000	18004	0C009	00000	10F0F	000EF	611	
001B8	XXT	00000	18080	00008	00000	00000	000E0	505	
001B8	XXT	00000	18080	00008	00000	00000	000E0	511	
001B8	XXT	00000	18080	00008	00000	00000	000E1	503	
001B8	XXT	00000	18080	00008	00000	00000	000E1	509	
001B8	XXT	00000	18080	0C009	20000	10F0F	000E1	609	
001B8	XXT	00000	18080	0C00B	20000	10F0F	000E0	210	
001B8	XXT	00000	18080	0C04A	20000	10F0F	000E1	509	
001B8	XXT	00000	18081	0C009	20000	10F0F	000E1	614	X
001B8	XXT	00400	04004	0C009	10000	10F0F	000E1	614	
001B8	XXT	304C2	04414	18009	10000	05558	00100	608	
001B8	XXT	304C2	04414	18009	10000	05558	CYCLE	605	
001B8	XXT	304C2	04414	18009	10000	05558	CYCLE	608	
001B9	XXT			00008		00000		413	
001B9	XXT			00008		0F000		414	
001B9	XXT			00008		1FF00		413	
001B9	XXT			00009		1FF00		413	
001C0	XXD			00100		20000		652	
001C0	XXD			0E008		00000		658	
001C0	XXD			0E008		00000		658	X
001C0	XXD			0E009		00000		607	
001C0	XXD			0E009		00000		618	
001C0	XXD			0E009		00000		653	
001C0	XXD			0E009		00000		656	
001C0	XXD			0E009		00000		657	
001C0	XXD			0E009		00000		658	
001C0	XXD			0E009		00000		659	
001C0	XXD			0E009		00000		650	X
001C0	XXD			0E009		00000		653	X
001C0	XXD			0E00A		00000		657	
001C0	XXD	00000	04004	0E009	00000	00000	00030	610	
001C0	XXD	00000	04004	0E009	00000	00000	00030	611	
001C0	XXD	00000	04004	0E009	00000	00000	00030	614	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
001C0	XXD	00000	04004	0E009	00000	00000	00030	657	
001C0	XXD	00000	04084	0E009	20000	00000	00030	609	
001C0	XXD	00000	04085	0E009	00000	00000	00030	614	
001C0	XXD	00000	04085	0E009	00000	00000	00030	607	X
001C0	XXD	00000	04085	0E009	00000	00000	00030	614	X
001C0	XXD	00000	04086	0E00A	00000	00000	0010C	612	
001C0	XXD	00000	04086	0E00A	00000	00000	0010C	614	
001C0	XXD	00000	04186	0E00A	00000	00000	0010C	614	
001C0	XXD	00000	18004	0E009	00000	00000	00030	613	
001C0	XXT			0E009		00000		661	
001C8	XXD			0E009		00391		653	
001C8	XXD			0E009		00394		616	
001C8	XXD			0E00A		00388		616	
001C8	XXD			0E00A		0038A		620	
001C8	XXD			0E00A		00390		652	
001C8	XXD	00000	04004	0E00A	00000	00000	00030	610	
001C8	XXD	00000	04084	0E009	00000	00B10	00030	609	
001C8	XXD	00000	04084	0E00A	00000	0038E	00030	610	
001C8	XXD	00000	04084	0E00A	20000	00000	00030	609	
05008	X M X			19934		CYCLE		507	
05008	X M X			3000A		CYCLE		507	
0505A	XXD	00000	18080	10008	20000	00000	000E0	515	
0505A	XXM	00000	00000	10008	00000	00000	00000	116	
0505A	XXM	00000	00000	10008	00000	00000	00000	307	
0505A	XXM	00000	00004	10008	00000	00000	00000	313	
0505A	XXM	00000	00004	10008	00000	00000	00000	314	
0505A	XXM	00000	18080	10008	20000	00000	000E0	515	
0505A	XXT	00000	18080	10008	20000	00000	000E0	515	
050B4	XXM	00000	00404	00008	00000	00000	00000	624	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD		
050BC	X	D	X	01D00	1808C	08008	12000	00100	00100	606	X
050BC	X	D	X	01D00	1808C	08008	12000	00100	00100	612	X
050BC	X	D	X	01D00	1808C	0800B	10000	00100	00100	616	X
050BC	X	D	X	01D00	1808C	0800B	12000	00100	00100	606	X
050BC	X	D	X	01D80	1808C	08008	12000	00100	00100	606	X
050BC	X	D	X	01D80	1808C	08008	12000	00100	00100	661	X
050BC	X	D	X	0C000	1808C	08008	00000	00100	00100	612	
050BC	X	M	X	00000	00000	08008	00000	00100	00000	160	X
050BC	X	M	X	00000	00000	08008	00000	00100	00000	601	X
050BC	X	M	X	00000	00000	08008	00000	00100	00000	608	X
050BC	X	M	X	00000	00000	08008	00000	00100	00000	618	X
050BC	X	M	X	00000	00004	08008	00000	00100	00000	601	X
050BC	X	M	X	00000	00004	08008	00000	00100	00000	608	X
050BC	X	M	X	00000	0000C	08008	00000	00100	00100	601	
050BC	X	M	X	00102	0D040	00000	00000	08000	00000	661	X
050BC	X	M	X	00400	00004	08008	00000	00100	00000	601	X
050BC	X	M	X	00400	00004	08008	00340	00100	000E1	603	X
050BC	X	M	X	00400	20000	08008	02000	00100	00000	606	X
050BC	X	M	X	00480	00000	08008	02000	00100	00000	601	X
050BC	X	M	X	00480	00000	08008	02000	00100	00000	606	X
050BC	X	M	X	00480	00004	08008	00000	00100	00000	602	X
050BC	X	M	X	00480	00004	08008	00000	00100	00000	604	X
050BC	X	M	X	00480	00004	08008	00000	00100	00000	608	X
050BC	X	M	X	00480	00004	08008	00000	00100	20000	607	X
050BC	X	M	X	00480	00004	08008	00000	00100	20000	621	X
050BC	X	M	X	00480	00004	08008	00004	00100	00000	621	X
050BC	X	M	X	00480	20040	08008	02000	00100	00000	661	X
050BC	X	M	X	005C0	0000C	08008	02000	00100	00100	602	X
050BC	X	M	X	00CC0	0000C	08008	1E006	00100	00100	602	X
050BC	X	M	X	00DC0	0000C	08008	06000	00100	00100	602	X
050BC	X	M	X	01000	00000	08008	00000	00100	00000	601	X
050BC	X	M	X	01000	00000	08008	00000	00100	00000	604	X
050BC	X	M	X	01000	00000	08008	00000	00100	00000	608	X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
050BC	X	M	X	01000	00000	08008	00000	00100	00000 612 X
050BC	X	M	X	01000	00000	08008	00001	00100	00000 606 X
050BC	X	M	X	01000	00000	08008	001C0	00100	00000 604 X
050BC	X	M	X	01000	00004	08008	00000	00100	00000 160 X
050BC	X	M	X	01000	00004	08008	00000	00100	00000 607 X
050BC	X	M	X	01000	00004	08008	00000	00100	00000 612 X
050BC	X	M	X	01000	00004	08008	00000	00100	00000 620 X
050BC	X	M	X	01000	00004	08008	00000	00100	00800 604 X
050BC	X	M	X	01000	00004	08008	00000	00100	02000 607 X
050BC	X	M	X	01000	00004	08008	00010	00100	00000 605 X
050BC	X	M	X	01000	00004	08008	00040	00100	00000 604 X
050BC	X	M	X	01000	00004	08008	000C0	00100	00000 604 X
050BC	X	M	X	01000	00004	08008	00180	00100	00000 620 X
050BC	X	M	X	01000	00004	08008	001C0	00100	00000 604 X
050BC	X	M	X	01000	00004	08008	001C0	00100	00000 620 X
050BC	X	M	X	01000	00014	08008	00020	00100	00000 605 X
050BC	X	M	X	01000	00014	08008	00030	00100	00000 605 X
050BC	X	M	X	01400	00000	08008	00000	00100	00000 601 X
050BC	X	M	X	01400	00000	08008	18000	00100	00000 602 X
050BC	X	M	X	01400	00000	08008	18000	00100	00000 619 X
050BC	X	M	X	014C0	0000C	08008	10000	00100	00000 619 X
050BC	X	M	X	01C00	00000		140C0	00100	00000 604 X
050BC	X	M	X	01C00	00000	08008	10000	00100	00000 602 X
050BC	X	M	X	01C00	00000	08008	14000	00100	00000 602 X
050BC	X	M	X	01C00	00000	08008	18000	00100	00000 619 X
050BC	X	M	X	01C00	00004	08008	10000	00100	00100 602 X
050BC	X	M	X	01C00	0000C	08008	12000	00100	00100 608 X
050BC	X	M	X	01C00	0000C	08008	10000	00100	00100 301 X
050BC	X	M	X	01C00	00014	08008	14010	00100	00000 605 X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
050BC	X	M	X	01C40	0000C	08008	12000	00100	0010 615 X
050BC	X	M	X	01C40	0000C	08008	12000	00100	00100 623 X
050BC	X	M	X	01D00	00004	08008	10000	00100	00100 602 X
050BC	X	M	X	01D00	0000C	00008	12000	00100	00100 612 X
050BC	X	M	X	01D00	0000C	08008	10000	00100	00100 602 X
050BC	X	M	X	01D00	0000C	08008	10000	00100	00100 621 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 600 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 602 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 606 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 612 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 615 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 616 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 621 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 623 X
050BC	X	M	X	01D00	0000C	08008	12000	00100	00100 624 X
050BC	X	M	X	01D00	0000C	0800B	10000	00100	00100 601 X
050BC	X	M	X	01D00	0000C	0800B	10000	00100	00100 616 X
050BC	X	M	X	01D00	0000C	0800B	12000	00100	00100 606 X
050BC	X	M	X	01D02	0000C	08008	12000	00100	00100 600 X
050BC	X	M	X	01D30	0000C	08008	12000	00100	00100 661 X
050BC	X	M	X	01D80	0000C	08008	12000	00100	00100 161 X
050BC	X	M	X	01D80	0000C	08008	12000	00100	00100 606 X
050BC	X	M	X	01D80	0000C	08008	12000	00100	00100 608 X
050BC	X	M	X	01D80	0000C	08008	12000	00100	00100 621 X
050BC	X	M	X	01D80	0000C	08008	12000	00100	00100 622 X
050BC	X	M	X	01D80	0000C	08008	12000	00100	00100 623 X
050BC	X	M	X	01D80	0000C	08008	12000	00100	00100 659 X
050BC	X	M	X	01D80	1808C	08008	12000	00100	00100 661 X
050BC	X	M	X	01DC0	0000C		16000	00100	00100 602 X
050BC	X	M	X	09000	00000	08008	00000	00100	00000 617 X
050BC	X	M	X	09000	00000	08008	00000	00100	00000 618 X
050BC	X	M	X	09000	00004	08008	00000	00100	00000 160 X
050BC	X	M	X	09000	00004	08008	00000	00100	00000 600 X
050BC	X	M	X	09CC0	0000C	08008	10000	00100	00000 600 X
050BC	X	M	X	0B000	00004	08008	00000	00100	00000 600 X
050BC	X	M	X	0B008	00004	01008	00000	00100	00000 600 X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
050BC	X	M	X	0C000	0000C	08008	00000	00100	00100 612
050BC	X	M	X	0C000	0400C	08008	00280	00100	00155 606
050BC	X	M	X	0D000	00000	08008	00000	00100	00000 160 X
050BC	X	M	X	0D000	00000	08008	00000	00100	00000 602 X
050BC	X	M	X	0D000	00000	08008	00000	00100	00000 619 X
050BC	X	M	X	0D000	00004	08008	00000	00100	00000 602 X
050BC	X	M	X	0D040	00000	08008	00000	00100	00000 661 X
050BC	X	M	X	0D040	00004	08008	00000	00100	00000 659 X
050BC	X	M	X	0D044	00004	08008	00000	00100	00000 615 X
050BC	X	M	X	0D400	00004	08008	08000	00100	00000 619 X
050BC	X	M	X	0D800	00000	08008	00000	00100	00000 619 X
050BC	X	M	X	0D800	00004	08008	00000	00100	00000 619 X
050BC	X	M	X	0DC00	00000	08008	10000	00400	00000 160 X
050BC	X	M	X	0DD80	00804	08008	10846	00100	00000 606 X
050BC	X	M	X	2B000	00014	08008	00010	00100	00000 600 X
050BC	X	M	X	3D000	00014	08008	00010	00100	00000 600 X
050BC	X	T	X	01D00	1808C	08008	12000	00100	00100 606 X
050BC	X	T	X	01D00	1808C	08008	12000	00100	00100 612 X
050BC	X	T	X	01D00	1808C	0800B	10000	00100	00100 616 X
050BC	X	T	X	01D00	1808C	0800B	12000	00100	00100 606 X
050BC	X	T	X	01D80	1808C	08008	12000	00100	00100 606 X
050BC	X	T	X	01D80	1808C	08008	12000	00100	00100 661 X
050BC	X	T	X	0C000	1808C	08008	00000	00100	00100 612
050C8	XXD			00000	04004	08009	00000	00000	00002 618
050C8	XXD			00000	1808C	08009	00000	00000	00100 609
050C8	XXM			00000	00000	08008	00000		01800 604
050C8	XXM			00000	00000	08008	00000	00000	00800 604
050C8	XXM			00000	00000	08008	00001	00000	00000 606
050C8	XXM			00000	00004	08008	00001	00000	00000 606

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
050C8	XXM	00000	0000C	08008	00000	00000	00100	621	
050C8	XXM	00000	0000C	08009	00000	00000	00100	609	
050C8	XXM	00000	0000C	0800A	00000	00000	00100	609	
050C8	XXM	00000	04005	08008	00000	00000	000E1	618	X
050C8	XXM	00000	04085	08008	20000	00000	00000	615	X
050C8	XXM	00000	04085	08008	20000	00000	00000	623	X
050C8	XXM	00000	18804	08008	00042	00000	00000	606	
050C8	XXM	00000	18C04	08008	00000	00000	00000	601	
050C8	XXM	00000	18C04	08008	00000	00000	00000	609	
050C8	XXM	00000	18C04	08008	00000	00000	00000	619	
050C8	XXM	00000	18C04	08008	00000	00000	00000	651	
050C8	XXM	00000	18C04	08008	00000	00000	00000	652	
050C8	XXM	00000	18C04	08008	00000	00000	00000	653	
050C8	XXM	00480	00000	08008	02000	00000	00000	624	
050C8	XXM	00480	00004	08008	02000	00000	00000	602	
050C8	XXM	00580	0000C	08008	02000	00000	00000	602	
050C8	XXM	024C2	18412	08008	10000	00000	00000	617	
050C8	XXT	00000	04005	08008	00000	00000	000E1	618	
050C8	XXT	00000	1808C	08009	00000	00000	00100	609	
05143	X M X	164D6	1C420	18008	30038	00100	00000	658	
05144	X M X	01C00	04004	18008	14F40	00100	001EE	603	X
05144	X M X	01C00	18804	18008	14740	00100	00000	603	X
05144	X M X	0DCC0	0000C	18008	10000	00100	00000	603	X
05144	X M X	0DCC0	0000C	18008	10000	00100	00001	603	X
05148	X D X	01C00	1808C	18008	10000	00100	00100	601	X
05148	X D X	01C40	1808C	18008	12000	00100	00100	623	X
05148	X D X	01C60	18084	18008	10000	00100	00000	600	X
05148	X D X	01CC0	04084	18008	10040	00100	00001	600	X
05148	X D X	01CC0	04084	18008	10040	00100	00001	623	X
05148	X D X	01CC0	1808C	18008	12000	00100	00100	614	X
05148	X D X	01CC0	1808C	18008	12000	00100	00100	621	X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05148	X	D	X	01CC0	1808C	18008	12000	00100	00100 623 X
05148	X	D	X	01CD0	04084	18008	10040	00100	00001 615 X
05148	X	D	X	01CD0	04084	18008	10040	00100	00001 623 X
05148	X	D	X	01CE8	04084	18008	10040	00100	20001 623 X
05148	X	D	X	01D00	3808C	18008	12000	00100	00100 602 X
05148	X	D	X	01D80	1808C	18008	12000	00100	00100 621 X
05148	X	D	X	01D80	1808C	18008	12000	00100	00100 623 X
05148	X	M	X	00021	00407	18008	10000	00100	1E800 624 X
05148	X	M	X	00440	1800C	18008	10001	00100	00100 606
05148	X	M	X	014C0	0000C	18008	10000	00100	00000 601 X
05148	X	M	X	01680	0000C	18008	12000	00100	00100 622 X
05148	X	M	X	01850	18C04	18008	02244	00100	00100 601 X
05148	X	M	X	01C00	00004	18008	14340	00100	00000 603 X
05148	X	M	X	01C00	00004	18008	14340	00100	20100 603 X
05148	X	M	X	01C00	0000C	18008	10000	00100	00100 601 X
05148	X	M	X	01C00	00804	18008	14740	00100	00000 603 X
05148	X	M	X	01C40	00004	18008	10000	00100	00000 600 X
05148	X	M	X	01C40	1808C	18008	12000	00100	00100 623 X
05148	X	M	X	01C60	0000C	18008	12002	00100	00100 623 X
05148	X	M	X	01C60	0000C	18008	12004	00100	00100 623 X
05148	X	M	X	01C80	0000C	18008	12000	00100	00100 615 X
05148	X	M	X	01CC0	00004	18008	12000	00100	00000 622 X
05148	X	M	X	01CC0	0000C	18008	10000	00100	00000 606 X
05148	X	M	X	01CC0	0000C	18008	10000	00100	00000 612 X
05148	X	M	X	01CC0	0000C	18008	12000	00100	00100 606 X
05148	X	M	X	01CC0	0000C	18008	12000	00100	00100 608 X
05148	X	M	X	01CC0	0000C	18008	12000	00100	00100 612 X
05148	X	M	X	01CC0	0000C	18008	12000	00100	00100 614 X
05148	X	M	X	01CC0	0000C	18008	12000	00100	00100 615 X
05148	X	M	X	01CC0	0000C	18008	12000	00100	00100 621 X
05148	X	M	X	01CC0	04004	18008	10040	00100	00001 600 X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05148	X	M	X	01CC0	04004	18008	10040	00100	00001 605 X
05148	X	M	X	01CC0	04004	18008	10040	00100	00001 615 X
05148	X	M	X	01CC0	04004	18008	10040	00100	00001 618 X
05148	X	M	X	01CC0	04004	18008	10040	00100	00001 624 X
05148	X	M	X	01CC0	04004	19C00	10040	00100	00001 600 X
05148	X	M	X	01CC0	0400C	18008	10040	00100	00001 620 X
05148	X	M	X	01CC0	0400C	18008	10400	00100	00001 605 X
05148	X	M	X	01CC0	0400C	18008	11C00	00100	001FF 603 X
05148	X	M	X	01CC0	04084	18008	10040	00100	00001 623 X
05148	X	M	X	01CC0	1808C	18008	12000	00100	00100 623 X
05148	X	M	X	01CC1	04404	18008	10000	00100	00000 604 X
05148	X	M	X	01CC8	04004	18008	10000	00100	00000 607 X
05148	X	M	X	01CC8	04004	18008	10040	00100	00001 607 X
05148	X	M	X	01CC8	04004	18008	10040	00100	00001 617 X
05148	X	M	X	01CC8	04004	18008	10040	00100	00001 624 X
05148	X	M	X	01CC8	04004	18008	80040	00100	00001 624 X
05148	X	M	X	01CC8	04404	18008	10000	00100	00000 604 X
05148	X	M	X	01CC8	04404	18008	10000	00100	00000 607 X
05148	X	M	X	01CD0	04004	18008	10040	00100	00001 615 X
05148	X	M	X	01CD0	04084	18008	10040	00100	00001 623 X
05148	X	M	X	01CE0	0000C	18008	11800	00100	001FF 620 X
05148	X	M	X	01CE0	04004	14004	10040	00100	00001 615 X
05148	X	M	X	01CE0	0400C	18008	10210	00100	001FF 605 X
05148	X	M	X	01CE8	04084	18008	10040	00100	20001 623 X
05148	X	M	X	01D00	0000C	18008	12000	00100	00100 602 X
05148	X	M	X	01D80	0000C	18008	12000	00100	00100 615 X
05148	X	M	X	01D80	0000C	18008	12000	00100	00100 618 X
05148	X	M	X	01D80	0000C	18008	12000	00100	00100 621 X
05148	X	M	X	01D80	0000C	18008	12000	00100	00100 622 X
05148	X	M	X	01D80	1808C	18008	12000	00100	00100 623 X
05148	X	M	X	01DC0	0000C	18008	12000	00100	00100 615 X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05148	X	M	X	0D000	0000C	18008	10000	00100	00100 602 X
05148	X	M	X	0DCC0	0000C	18008	10000	00100	00000 603 X
05148	X	M	X	0DCC0	0000C	18008	10800	00100	00001 603 X
05148	X	M	X	0DCC0	0100C	18008	10000	00100	00100 613 X
05148	X	M	X	0DCC0	0400C	18008	10000	00100	00001 603 X
05148	X	M	X	0DCC0	0400C	18008	10080	00100	00001 604 X
05148	X	M	X	0DCC0	0400C	18008	10200	01000	00001 604 X
05148	X	M	X	0DCC0	0400C	18008	10300	00100	00001 604 X
05148	X	M	X	0DCC0	0400C	18008	10400	00100	00001 603 X
05148	X	M	X	0DCC0	0402C	18008	11C00	00100	001FF 606 X
05148	X	M	X	0DCC0	18A0C	18A08	10000	00100	00100 614 X
05148	X	M	X	0DCC8	04004	18008	10000	00100	00001 621 X
05148	X	M	X	0DCE0	0000C	18008	10000	00100	00000 620 X
05148	X	M	X	0DCE0	0000C	18008	10000	00100	00155 620 X
05148	X	M	X	0DCE0	0100C	18008	10000	00100	00100 613 X
05148	X	M	X	0DCE0	0400C	18008	10200	00100	00001 604 X
05148	X	M	X	0DCE0	1980C	18008	10000	00100	00100 658 X
05148	X	M	X	11CC4	04004	18008	10040	00100	00001 605 X
05148	X	M	X	11CC4	04004	18008	10040	00100	00001 615 X
05148	X	M	X	1C4C2	04004	18008	10000	00100	00100 614
05148	X	T	X	01C00	1808C	18008	10000	00100	00100 601 X
05148	X	T	X	01C40	1808C	18008	12000	00100	00100 623 X
05148	X	T	X	01C60	18084	18008	10000	00100	00000 600 X
05148	X	T	X	01CC0	04084	18008	10040	00100	00001 600 X
05148	X	T	X	01CC0	04084	18008	10040	00100	00001 623 X
05148	X	T	X	01CC0	1808C	18008	12000	00100	00100 614 X
05148	X	T	X	01CC0	1808C	18008	12000	00100	00100 621 X
05148	X	T	X	01CC0	1808C	18008	12000	00100	00100 623 X
05148	X	T	X	01CD0	04084	18008	10040	00100	00001 615 X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD	
05148	X	T	X	01CD0	04084	18008	10040	00100	00001	623 X
05148	X	T	X	01CE8	04084	18008	10040	00100	20001	623 X
05148	X	T	X	01D00	1808C	18008	12000	00100	00100	602 X
05148	X	T	X	01D80	1808C	18008	12000	00100	00100	621 X
05148	X	T	X	01D80	1808C	18008	12000	00100	00100	623 X
0514A	X	D	X	1C4C2	04414	18008	10000	00100	0010F	621
0514A	X	M	X	0C000	04085	18008	20000	05148	00000	607 X
0514A	X	M	X	0C000	04085	18008	20000	05148	00000	612 X
0514A	X	M	X	0C440	04084	18008	30000	05148	00000	607
0514A	X	M	X	0C4C8	04084	18008	30000	05148	00000	607
0514A	X	M	X	0C4C8	04084	18008	30000	05148	00000	614
0514A	X	M	X	0C4C8	04084	18008	30000	05148	08000	607
0514A	X	M	X	1C4C2	04404	18008	10000	00100	00800	605
0514A	X	M	X	1C4C2	04404	18008	10000	00100	00800	619
0514A	X	M	X	1C4C2	04414	18008	10000	00100	00100	160
0514A	X	M	X	1C4C2	04414	18008	10000	00100	0010F	621
0514A	X	T	X	1C4C2	04414	18008	10000	00100	0010F	621
0514C	X	M	X	0C000	04085	18008	20000	05148	00000	612 X
0514C	X	M	X	0C440	04084	18008	30000	05148	04000	607
0514C	X	M	X	164D6	16420	18008	30038	00100	00000	658
0514C	X	M	X	164D6	1C420	18008	30038	00100	00000	658
0514C	X	M	X	1C4CA	04004	18008	10000	00100	30000	624
0514C	X	T	X	164D6	16420	18008	30038	00100	00000	658
05150	XXM			304C2	04414	00008	10000	00000	CYCLE	655
05154	XXD					0004A		04040		650
05154	XXD			00000	18080	00049	20000	04040	00030	650
05154	XXD			00000	1808C	00008	00000	00000	00100	610
05154	XXD			00000	1808C	00008	00000	00000	00100	623
05154	XXD			00000	1808C	00008	00000	00000	00400	623

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXD	00000	1808C	00008	00001	00000	00100	606	
05154	XXD	00000	1808C	00008	00001	00000	00100	661	
05154	XXD	00000	18C04	00008	04B00	00000	00000	602	
05154	XXD	00400	18C04	00008	10000	00000	00000	621	
05154	XXD	00400	18C04	00008	10000	00000	00000	650	
05154	XXD	00480	1808C	00008	10001	00000	00100	616	
05154	XXD	004C0	04404	00008	30010	00100	00000	623	
05154	XXD	004C0	04414	00008	10010	00100	0010F	623	
05154	XXD	10482	04414	00008	10000	00100	0010F	623	
05154	XXD	104C2	04400	00008	10000	00100	0010F	600	
05154	XXD	104C2	04400	00008	10000	00100	0010F	621	
05154	XXD	104C2	04414	00008	10000	00100	0010F	605	
05154	XXD	104C2	04414	00008	10000	00100	0010F	612	
05154	XXD	304C2	04404	00008	10000	00100	00155	608	
05154	XXD	304C2	04434	00008	10000	00100	00000	617	
05154	XXD	324C0	04404	00008	30030	00100	00000	624	
05154	XXM			0004A		04040		650	
05154	XXM	00000	00000	00008	00000	00000	00000	301	
05154	XXM	00000	00002	00008	00000	00000	00100	650	
05154	XXM	00000	00002	00008	00000	00000	00100	651	
05154	XXM	00000	0000C	00008	00000	00000	00000	622	
05154	XXM	00000	0000C	00008	00000	00000	00100	160	
05154	XXM	00000	0000C	00008	00000	00000	00100	609	
05154	XXM	00000	0000C	00008	00000	00000	00100	610	
05154	XXM	00000	0000C	00008	00000	00000	00100	613	
05154	XXM	00000	0000C	00008	00000	00000	00100	617	
05154	XXM	00000	0000C	00008	00000	00000	00100	620	
05154	XXM	00000	0000C	00008	00000	00000	00100	650	
05154	XXM	00000	0000C	00008	00000	00000	00100	651	
05154	XXM	00000	0000C	00008	00000	00000	00100	652	
05154	XXM	00000	0000C	00008	00000	00000	00100	653	
05154	XXM	00000	0000C	00008	00140	00000	00100	604	
05154	XXM	00000	0000C	00008	00340	00000	00100	603	
05154	XXM	00000	0000C	00008	00480	00000	00100	603	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXM	00000	0000C	00008	01000	00000	00100	603	
05154	XXM	00000	04004	00008	00000	00300	00002	657	
05154	XXM	00000	04084	00008	20000	00100	00000	515	
05154	XXM	00000	04084	00008	20000	00100	00000	612	
05154	XXM	00000	04085	00008	20000	00100	00000	515	X
05154	XXM	00000	04085	18008	20000	CYCLE	00000	601	
05154	XXM	00000	1800C	00008	00001	00000	00100	605	
05154	XXM	00000	1800C	00008	00001	00000	00100	606	
05154	XXM	00000	1800C	00008	00001	00000	00100	614	
05154	XXM	00000	1800C	00008	00001	00000	00100	659	
05154	XXM	00000	1800C	00008	00001	00000	00100	661	
05154	XXM	00000	1808C	00008	00000	00000	00100	623	
05154	XXM	00000	1808C	00008	00000	00000	00400	623	
05154	XXM	00000	1808C	00008	00001	00000	00100	661	
05154	XXM	00000	1880C	00008	00400	00000	00000	603	
05154	XXM	00000	18C00	00008	20008	00441	00000	605	
05154	XXM	00000	18C00	00008	20018	00441	00000	605	
05154	XXM	00000	18C04	00008	00000	00000	00000	608	
05154	XXM	00000	18C04	00008	00000	00000	00000	609	
05154	XXM	00000	18C04	00008	00000	00000	00000	610	
05154	XXM	00000	18C04	00008	00000	00000	00000	611	
05154	XXM	00000	18C04	00008	00000	00000	00000	614	
05154	XXM	00000	18C04	00008	00000	00000	00000	617	
05154	XXM	00000	18C04	00008	00000	00000	00000	618	
05154	XXM	00000	18C04	00008	00000	00000	00000	619	
05154	XXM	00000	18C04	00008	00000	00000	00000	620	
05154	XXM	00000	18C04	00008	00000	00000	00000	650	
05154	XXM	00000	18C04	00008	00000	00000	00000	651	
05154	XXM	00000	18C04	00008	00000	00000	00000	652	
05154	XXM	00000	18C04	00008	00000	00000	00000	653	
05154	XXM	00000	18C04	00008	00000	00000	00000	657	
05154	XXM	00000	18C04	00008	00000	00001	00000	613	
05154	XXM	00000	18C04	00008	00000	00004	00000	653	
05154	XXM	00000	18C04	00008	00000	00100	00000	658	
05154	XXM	00000	18C04	00008	00000	00200	00000	651	
05154	XXM	00000	18C04	00008	00000	00800	00000	651	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXM	00000	18C04	00008	00000	02000	00000	650	
05154	XXM	00000	18C04	00008	00000	02000	00000	652	
05154	XXM	00000	18C04	00008	00000	02020	00000	652	
05154	XXM	00000	18C04	00008	00000	18000	00000	650	
05154	XXM	00000	18C04	00008	00000	18001	00000	613	
05154	XXM	00000	18C04	00008	00040	00000	00000	604	
05154	XXM	00000	18C04	00008	04B00	00000	00000	602	
05154	XXM	00000	18C04	00008	20008	00042	00000	605	
05154	XXM	00000	18C04	0004A	00000	04040	00000	650	
05154	XXM	00000	18C04	05154	00000	00000	00000	617	
05154	XXM	00400	8C04	00008	10000	00006	00000	654	
05154	XXM	00400	0000C	00008	10000	00000	00100	614	
05154	XXM	00400	1880C	00008	10A00	00000	00155	603	
05154	XXM	00400	1880C	00008	10E00	00000	00100	603	
05154	XXM	00400	18C04	00008	10000		00000	609	
05154	XXM	00400	18C04	00008	10000	00000	00000	602	
05154	XXM	00400	18C04	00008	10000	00000	00000	610	
05154	XXM	00400	18C04	00008	10000	00000	00000	614	
05154	XXM	00400	18C04	00008	10000	00000	00000	621	
05154	XXM	00400	18C04	00008	10000	00000	00000	650	
05154	XXM	00400	18C04	00008	10000	00000	00000	651	
05154	XXM	00400	18C04	00008	10000	00000	00000	654	
05154	XXM	00400	18C04	00008	10000	1C000	00000	617	
05154	XXM	00400	18C04	00008	10200	00002	00000	603	
05154	XXM	00410	0000C	00008	10000	00000	00100	615	
05154	XXM	00410	0000C	00008	10000	00000	00100	661	
05154	XXM	00414	0000C	00008	10000	00000	00100	661	
05154	XXM	00440	04084	00008	00000	00100	00000	622	
05154	XXM	00440	04084	00008	30000	00100	00000	622	
05154	XXM	00440	04086	00008	30000	00100	00000	612	
05154	XXM	00480	0000C	00008	02000	00000	00000	602	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXM	00480	0000C	00008	10000	00000	00100	606	
05154	XXM	00480	1800C	00008	10001	00000	00100	616	
05154	XXM	00480	1800C	00008	11001	00000	00100	620	
05154	XXM	004C0	04404	00008	30010	00100	00000	623	
05154	XXM	004C0	04414	00008	10010	00100	0010F	623	
05154	XXM	004C2	00404	00008	10000	00100	00000	613	
05154	XXM	004C2	00404	00008	10000	00100	00000	621	
05154	XXM	004C6	04414	00008	10010	00100	00100	605	
05154	XXM	004C6	04414	00008	10010	00100	0010F	605	
05154	XXM	004C8	04414	00008	10010	00100	0010F	615	
05154	XXM	004C8	04414	00008	10010	00100	0010F	623	
05154	XXM	004D0	1C404	00008	30010	00100	00000	613	
05154	XXM	004D0	1C404	00008	30010	00100	00000	621	
05154	XXM	004D0	1E400	00008	30010	00100	00000	658	
05154	XXM	00CC0	04084	00008	10000	00F00	00100	620	
05154	XXM	10000	04004	00008	00000	00100	00000	614	
05154	XXM	10000	04004	00008	00000	00100	00000	621	
05154	XXM	10000	04004	00008	00000	00100	00000	658	
05154	XXM	10000	04004	00008	00000	00100	00001	611	
05154	XXM	10000	04004	00008	00000	00100	00001	660	
05154	XXM	10000	04004	00008	00000	00100	00002	660	
05154	XXM	10000	04004	00008	00000	00100	00010	660	
05154	XXM	10000	04004	00008	00000	00100	00020	660	
05154	XXM	10000	04004	00008	00000	00100	00040	660	
05154	XXM	10000	04004	00008	00000	00100	00080	660	
05154	XXM	10000	04004	00008	00000	00300	00002	611	
05154	XXM	10000	04004	00008	00000	01100	00010	656	
05154	XXM	10000	04004	00008	00000	02100	00020	656	
05154	XXM	10000	04004	00008	00000	04100	00040	656	
05154	XXM	10000	04004	00008	00000	05500	000FF	618	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXM	10000	04004	00008	00000	05500	001FF	611	
05154	XXM	10000	04004	00008	00000	18100	00080	656	
05154	XXM	10000	04004	00008	00000	1E500	000FF	618	
05154	XXM	10000	04004	00008	00000	1E500	001FF	611	
05154	XXM	10000	04004	00008	00000	1F300	000F3	619	
05154	XXM	10000	04004	017FE	00000	00100	00001	657	
05154	XXM	10000	04024	00008	00000	00100	00101	611	
05154	XXM	10000	04084	00008	00000	00100	00000	658	
05154	XXM	10000	04084	00008	00000	00100	00004	660	
05154	XXM	10000	04084	00008	00000	00500	00004	657	
05154	XXM	10000	04104	00000	00008	00900	00008	657	
05154	XXM	10000	04104	00008	00000	00100	00000	658	
05154	XXM	10000	04104	00008	00000	00100	00008	660	
05154	XXM	10000	04404	00008	00000	00100	00000	614	
05154	XXM	10000	04414	00008	00000	00100	00000	604	
05154	XXM	10000	04414	00008	00000	00100	00000	614	
05154	XXM	10000	04414	00008	00000	00100	0010F	616	
05154	XXM	10000	04C04	00008	00000	00100	00000	613	
05154	XXM	10000	1C004	00008	00000	00100	00000	658	
05154	XXM	10000	1CC04	00008	00000	00100	00000	613	
05154	XXM	10000	1CC04	00008	00000	00100	00000	658	
05154	XXM	10482	04414	00008	10000	00100	0010F	623	
05154	XXM	104C0	04414	00001	10010	00100	0010F	600	
05154	XXM	104C0	04414	00008	10010	00100	0010F	600	
05154	XXM	104C2	04400	00008	10000	00100	0010F	600	
05154	XXM	104C2	04400	00008	10000	00100	0010F	605	
05154	XXM	104C2	04400	00008	10000	00100	0010F	621	
05154	XXM	104C2	04404	00008	10000	00100	00000	605	
05154	XXM	104C2	04404	00008	20000	00100	00000	612	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXM	104C2	04414	00008	10000	00100	0010F	605	
05154	XXM	104C2	04414	00008	10000	00100	0010F	612	
05154	XXM	10800	04494	00008	04000	00100	0010C	614	
05154	XXM	10800	04494	00008	04000	00100	0010C	621	
05154	XXM	10800	04494	00008	04000	00100	0010C	658	
05154	XXM	11CC0	04414	00008	10010	00100	0010F	601	
05154	XXM	11CC0	04414	00008	10010	00100	0010F	604	
05154	XXM	304C2	04114	00008	20000	00100	00100	610	
05154	XXM	304C2	04400	00008	10000	00100	0010F	605	
05154	XXM	304C2	04400	00008	10000	00100	0010F	622	
05154	XXM	304C2	04404	00008	10000	00100	0010C	608	
05154	XXM	304C2	04404	00008	10000	00100	0010F	616	
05154	XXM	304C2	04404	00008	10000	00100	00155	608	
05154	XXM	304C2	04414	00008	10000	00100	00100	605	
05154	XXM	304C2	04414	00008	10000	00100	00100	608	
05154	XXM	304C2	04414	00008	10000	00100	00100	617	
05154	XXM	304C2	04414	00008	10000	00100	00100	620	
05154	XXM	304C2	04414	00008	10000	00100	00100	652	
05154	XXM	304C2	04414	00008	10000	00100	00100	654	
05154	XXM	304C2	04414	00008	10000	00100	0010F	653	
05154	XXM	304C2	04414	00008	10000	00100	CYCLE	651	
05154	XXM	304C2	04414	00008	10000	00100	CYCLE	654	
05154	XXM	304C2	04414	00008	10000	00100	CYCLE	655	
05154	XXM	304C2	04414	00008	10000	00500	CYCLE	651	
05154	XXM	304C2	04414	00008	20000	00100	00100	610	
05154	XXM	304C2	04414	00008	20000	00100	00100	611	
05154	XXM	304C2	04414	00008	20000	00100	CYCLE	610	
05154	XXM	304C2	04414	18008	10000	00100	00100	602	
05154	XXM	304C2	04414	18008	10000	00100	00100	650	
05154	XXM	304C2	04414	18008	10000	00100	00100	651	
05154	XXM	304C2	04414	18008	10000	00100	001FF	602	
05154	XXM	304C2	04414	18008	10000	00100	CYCLE	611	
05154	XXM	304C2	04414	18008	10000	00100	CYCLE	650	
05154	XXM	304C2	04414	18008	10000	00100	CYCLE	653	
05154	XXM	304C2	04414	18008	10000	00100	CYCLE	654	
05154	XXM	304C2	04414	18008	10000	00100	CYCLE	655	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXM	304C2	04414	18008	10000	00108	CYCLE	653	
05154	XXM	304C2	04414	18008	10000	01100	CYCLE	650	
05154	XXM	304C2	04414	18008	10000	04100	CYCLE	650	
05154	XXM	304C2	04414	18008	10040	00100	CYCLE	604	
05154	XXM	304C2	04414	18008	20000	00100	CYCLE	611	
05154	XXM	304C2	04414	1800A	10000	00100	00101	651	
05154	XXM	304C2	04434	00008	00000	00100	00000	600	
05154	XXM	304C2	04434	00008	10000	00100	00000	617	
05154	XXM	306C2	04414	00008	10000	00100	001CB	617	
05154	XXM	324C0	04404	00008	30030	00100	00000	624	
05154	XXM	324C0	04404	032BE	30030	00100	00000	624	
05154	XXM	324C2	04400	00008	10000	00100	0010F	605	
05154	XXT	00000	1808C	00008	00000	00000	00100	623	
05154	XXT	00000	1808C	00008	00000	00000	00400	623	
05154	XXT	00000	1808C	00008	00001	00000	00100	606	
05154	XXT	00000	1808C	00008	00001	00000	00100	661	
05154	XXT	00000	18C04	00008	04B00	00000	00000	602	
05154	XXT	00400	18C04	00008	10000	00000	00000	621	
05154	XXT	00400	18C04	00008	10000	00000	00000	650	
05154	XXT	00400	1C404	00008	30010	00100	00000	613	
05154	XXT	00480	1808C	00008	00000	00000	00100	616	
05154	XXT	004C0	04404	00008	30010	00100	00000	623	
05154	XXT	004C0	04414	00008	10010	00100	0010F	623	
05154	XXT	004C2	00404	00008	10000	00100	00000	613	
05154	XXT	004C8	04414	00008	10010	00100	0010F	615	
05154	XXT	004D0	1C404	00008	30010	00100	00000	613	
05154	XXT	10000	04414	00008	00000	00100	00000	604	
05154	XXT	10000	04414	00008	00000	00100	0010F	616	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05154	XXT	10000	04C04	00008	00000	00100	00000	613	
05154	XXT	10000	1CC04	00008	00000	00100	00000	658	
05154	XXT	10482	04414	00008	10000	00100	0010F	623	
05154	XXT	104C2	04400	00008	10000	00100	0010F	600	
05154	XXT	104C2	04400	00008	10000	00100	0010F	621	
05154	XXT	104C2	04404	00008	10000	00100	00000	605	
05154	XXT	104C2	04404	00008	10000	00100	00000	612	
05154	XXT	104C2	04414	00008	10000	00100	0010F	605	
05154	XXT	104C2	04414	00008	10000	00100	0010F	612	
05154	XXT	304C2	04404	00008	10000	00100	0010C	608	
05154	XXT	304C2	04404	00008	10000	00100	00155	608	
05154	XXT	304C2	04434	00008	10000	00100	00000	617	
05154	XXT	324C0	04404	00008	30030	00100	00000	624	
05154	XXT	324C0	04404	00008	C0030	00100	00000	624	
05154	XXT	324C2	04400	00008	10000	00100	0010F	605	
05158	XXD			00008		00100		515	
05158	XXD			00008	20000	00100		515	X
05158	XXM			00008		00100		515	
05158	XXM			00008	20000	00100		515	X
05158	XXM	00000	18C04	00008	00000	00000	00000	652	
05158	XXT			00008		00100		515	
05158	XXT			00008	20000	00100		515	X
05158	XXT			0084A		04040		654	
05158	XXT	00000	18080	00008	20000	00000	000E1	500	
05158	XXT	00000	18080	0084A	00000	04040	000E1	610	
0516E	XXD	00000	04084	00009	20000	00000	00000	616	
0516E	XXM	00000	04084	00009	20000	00000	00000	601	
0516E	XXM	00000	04084	00009	20000	00000	00000	604	
0516E	XXM	00000	04084	00009	20000	00000	00000	616	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
0516E	XXT	00000	04084	00009	20000	00000	00000	616	
05186	XXD	00000	04084	00009	20000	00101	00000	609	
05186	XXM	00000	04084	00009	20000	00000	00000	609	
05186	XXM	00000	04084	00009	20000	00000	00000	610	
05186	XXM	00000	04084	00009	20000	00000	00000	611	
05186	XXM	00000	04084	00009	20000	00000	00000	617	
05186	XXM	00000	04084	00009	20000	00000	00000	651	
05186	XXM	00000	04084	00009	20000	00000	00000	652	
05186	XXM	00000	04084	00009	20000	00101	00000	609	
05186	XXM	00000	04084	00009	20000	00160	00000	617	
05186	XXM	00000	04084	00009	20000	00300	00000	651	
05186	XXM	00000	04084	00009	20000	00300	00000	657	
05186	XXM	00000	04084	00009	20000	00500	00000	651	
05186	XXM	00000	04084	00009	20000	00500	00000	657	
05186	XXM	00000	04084	00009	20000	00900	00000	651	
05186	XXM	00000	04084	00009	20000	00900	00000	657	
05186	XXM	00000	04084	00009	20000	01100	00000	650	
05186	XXM	00000	04084	00009	20000	02100	00000	656	
05186	XXM	00000	04084	00009	20000	04100	00000	650	
05186	XXM	00000	04084	00009	20000	04100	00000	656	
05186	XXM	00000	04084	00009	20000	05500	00000	617	
05186	XXM	00000	04084	00009	20000	05500	00000	653	
05186	XXM	00000	04084	00009	20000	05560	00000	610	
05186	XXM	00000	04084	00009	20000	18080	00000	650	
05186	XXM	00000	04084	00009	20000	18100	00000	656	
05186	XXM	00000	04084	00009	20000	1FF00	00000	652	
05186	XXM	00000	04084	00009	20010	00000	00000	605	
05186	XXM	00000	04084	00009	20340	00001	00000	603	
05186	XXM	00000	04094	00009	20000	01100	00000	656	
05186	XXM	00000	18080	00009	20000	1D200	00000	651	
05186	XXM	304C2	04414	18008	10000	0007D	00100	655	
05186	XXM	304C2	04414	18008	10000	000D6	CYCLE	655	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05186	XXM	304C2	04414	18008	20000	000E3	00100	653	
05186	XXT	00000	04084	00009	20000	00101	00000	609	
05186	XXT	00000	04084	00009	20000	00300	00000	657	
05187	XXM	00000	04081	18008	00000	20000	00000	616	X
05187	XXM	00000	04081	18008	20000	00000	00000	616	X
05196	XXM	00000	04084	00009	20000	02100	00000	650	
05198	XXD	00000	04080	00009	20000	000F0	00000	622	
05198	XXD	00000	04084	00009	20000	00000	00000	612	
05198	XXD	00000	04084	00009	20000	00000	00000	656	
05198	XXD	00000	04084	00009	20000	00080	00000	656	
05198	XXD	00000	04084	00009	20000	00FF0	00000	605	
05198	XXD	00000	04084	00009	20000	00FF0	00000	610	
05198	XXD	00000	04084	0000A	20000	00007	00000	610	
05198	XXD	00000	04084	0000A	20000	00010	00000	656	
05198	XXD	00000	04084	0000A	20000	00020	00000	656	
05198	XXD	00000	04084	0000A	20000	00040	00000	656	
05198	XXD	32000	04414	00009	00030	00FF0	00100	607	
05198	XXM	00000	04080	00009	20000	00000	00000	616	
05198	XXM	00000	04080	00009	20000	000F0	00000	622	
05198	XXM	00000	04080	00009	20000	00FF0	00000	605	
05198	XXM	00000	04080	00009	20010	000F0	00000	605	
05198	XXM	00000	04084	0000	20000	00020	00000	656	
05198	XXM	00000	04084	00000	20000	00010	00000	656	
05198	XXM	00000	04084	00009	20000		00000	609	
05198	XXM	00000	04084	00009	20000	00000	00000	608	
05198	XXM	00000	04084	00009	20000	00000	00000	609	
05198	XXM	00000	04084	00009	20000	00000	00000	612	
05198	XXM	00000	04084	00009	20000	00000	00000	616	
05198	XXM	00000	04084	00009	20000	00000	00000	650	
05198	XXM	00000	04084	00009	20000	00000	00000	651	
05198	XXM	00000	04084	00009	20000	00000	00000	652	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05198	XXM	00000	04084	00009	20000	00000	00000	653	
05198	XXM	00000	04084	00009	20000	00000	00000	656	
05198	XXM	00000	04084	00009	20000	00000	00000	657	
05198	XXM	00000	04084	00009	20000	00007	00000	609	
05198	XXM	00000	04084	00009	20000	00080	00000	652	
05198	XXM	00000	04084	00009	20000	00080	00000	656	
05198	XXM	00000	04084	00009	20000	000F0	00000	605	
05198	XXM	00000	04084	00009	20000	000F0	00000	608	
05198	XXM	00000	04084	00009	20000	000F0	00000	609	
05198	XXM	00000	04084	00009	20000	000F0	00000	610	
05198	XXM	00000	04084	00009	20000	000F0	00000	611	
05198	XXM	00000	04084	00009	20000	000F0	00000	617	
05198	XXM	00000	04084	00009	20000	000F0	00000	622	
05198	XXM	00000	04084	00009	20000	000F0	00000	655	
05198	XXM	00000	04084	00009	20000	000FF	00000	611	
05198	XXM	00000	04084	00009	20000	00200	00000	657	
05198	XXM	00000	04084	00009	20000	00400	00000	651	
05198	XXM	00000	04084	00009	20000	00400	00000	657	
05198	XXM	00000	04084	00009	20000	00800	00000	651	
05198	XXM	00000	04084	00009	20000	00800	00000	657	
05198	XXM	00000	04084	00009	20000	00110	00000	653	
05198	XXM	00000	04084	00009	20000	00F00	00000	617	
05198	XXM	00000	04084	00009	20000	00F00	00000	618	
05198	XXM	00000	04084	00009	20000	00F00	00000	653	
05198	XXM	00000	04084	00009	20000	00FF0	00000	602	
05198	XXM	00000	04084	00009	20000	00FF0	00000	605	
05198	XXM	00000	04084	00009	20000	00FF0	00000	608	
05198	XXM	00000	04084	00009	20000	00FF0	00000	609	
05198	XXM	00000	04084	00009	20000	00FF0	00000	610	
05198	XXM	00000	04084	00009	20000	00FF0	00000	611	
05198	XXM	00000	04084	00009	20000	00FF0	00000	616	
05198	XXM	00000	04084	00009	20000	00FF0	00000	617	
05198	XXM	00000	04084	00009	20000	00FF0	00000	618	
05198	XXM	00000	04084	00009	20000	00FF0	00000	619	
05198	XXM	00000	04084	00009	20000	00FF0	00000	620	
05198	XXM	00000	04084	00009	20000	00FF0	00000	652	
05198	XXM	00000	04084	00009	20000	00FF0	00000	653	
05198	XXM	00000	04084	00009	20000	00FF0	00000	654	
05198	XXM	00000	04084	00009	20000	00FF0	00000	655	
05198	XXM	00000	04084	00009	20000	1F0F0	00000	610	
05198	XXM	00000	04084	00009	20000	1FF00	00000	611	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05198	XXM	00000	04084	00009	20000	1FFF0	00000	653	
05198	XXM	00000	04084	0000A	20000	00000	00000	650	
05198	XXM	00000	04084	0000A	20000	00000	00000	653	
05198	XXM	00000	04084	0000A	20000	00000	00000	656	
05198	XXM	00000	04084	0000A	20000	00000	00000	657	
05198	XXM	00000	04084	0000A	20000	00001	00000	609	
05198	XXM	00000	04084	0000A	20000	00001	00000	653	
05198	XXM	00000	04084	0000A	20000	00001	00000	657	
05198	XXM	00000	04084	0000A	20000	00002	00000	653	
05198	XXM	00000	04084	0000A	20000	00004	00000	653	
05198	XXM	00000	04084	0000A	20000	00004	00000	657	
05198	XXM	00000	04084	0000A	20000	00007	00000	610	
05198	XXM	00000	04084	0000A	20000	00008	00000	653	
05198	XXM	00000	04084	0000A	20000	0000F	00000	611	
05198	XXM	00000	04084	0000A	20000	00010	00000	652	
05198	XXM	00000	04084	0000A	20000	00010	00000	656	
05198	XXM	00000	04084	0000A	20000	00020	00000	652	
05198	XXM	00000	04084	0000A	20000	00020	00000	656	
05198	XXM	00000	04084	0000A	20000	00040	00000	652	
05198	XXM	00000	04084	0000A	20000	00040	00000	656	
05198	XXM	00000	04084	0E009	20000	00000	00000	657	
05198	XXM	00000	04084	19900	20000	00008	00000	657	
05198	XXM	00000	04084	20000	000F0	00000		618	
05198	XXM	00000	06080	00009	20000	000F0	00000	613	
05198	XXM	00000	14044	00009	20000	00FF0	00000	655	
05198	XXM	00000	14084	00009	20000	00FF0	00000	655	
05198	XXM	00002	04084	00009	20000	00FF0	00000	610	
05198	XXM	304C2	04414	18008	10000	00040	CYCLE	652	
05198	XXM	32000	04414	00009	00030	00FF0	00100	607	
05198	XXT	00000	04080	00009	20000	000F0	00000	622	
05198	XXT	00000	04084	00009	20000	00000	00000	608	
05198	XXT	00000	04084	00009	20000	00000	00000	612	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05198	XXT	00000	04084	00009	20000	00000	00000	656	
05198	XXT	00000	04084	00009	20000	00000	00000	657	
05198	XXT	00000	04084	00009	20000	00007	00000	609	
05198	XXT	00000	04084	00009	20000	00080	00000	656	
05198	XXT	00000	04084	00009	20000	000F0	00000	618	
05198	XXT	00000	04084	00009	20000	000FF	00000	611	
05198	XXT	00000	04084	00009	20000	00400	00000	657	
05198	XXT	00000	04084	00009	20000	00800	00000	657	
05198	XXT	00000	04084	00009	20000	00F00	00000	618	
05198	XXT	00000	04084	00009	20000	00FF0	00000	605	
05198	XXT	00000	04084	00009	20000	00FF0	00000	610	
05198	XXT	00000	04084	00009	20000	00FF0	00000	611	
05198	XXT	00000	04084	00009	20000	00FF0	00000	652	
05198	XXT	00000	04084	00009	20000	1FF00	00000	611	
05198	XXT	00000	04084	00009	20010	000F0	00000	605	
05198	XXT	00000	04084	0000A	20000	00000	00000	656	
05198	XXT	00000	04084	0000A	20000	00000	00000	657	
05198	XXT	00000	04084	0000A	20000	00001	00000	657	
05198	XXT	00000	04084	0000A	20000	00002	00000	657	
05198	XXT	00000	04084	0000A	20000	00004	00000	657	
05198	XXT	00000	04084	0000A	20000	00007	00000	610	
05198	XXT	00000	04084	0000A	20000	0000F	00000	611	
05198	XXT	00000	04084	0000A	20000	00010	00000	656	
05198	XXT	00000	04084	0000A	20000	00020	00000	656	
05198	XXT	00000	04084	0000A	20000	00040	00000	656	
05198	XXT	00000	04084	19900	20000	00008	00000	657	
05198	XXT	32000	04414	00009	00030	00FF0	00100	607	
051E8	X D X	00440	04084	18008	30000	00100	00000	623	X
051E8	X D X	00480	04084	18008	22000	00100	00000	606	X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
051E8	X D X	01C60	0408C	18008	12004	00100	00100	614	X
051E8	X D X	01CD0	04084	18008	10050	00100	00001	600	X
051E8	X M X	00440	04084	18008	30000	00100	00000	623	X
051E8	X M X	00480	04084	18008	22000	00100	00000	606	X
051E8	X M X	01C60	0408C	18008	12004	00100	00100	614	X
051E8	X M X	01CD0	04084	18008	10050	00100	00001	600	X
051E8	X M X	01CD0	04084	18008	10050	00100	00001	618	X
051E8	X T X	00440	04084	18008	30000	00100	00000	623	X
051E8	X T X	00480	04084	18008	22000	00100	00000	606	X
051E8	X T X	01C60	0408C	18008	12004	00100	00100	614	X
051E8	X T X	01CD0	04084	18008	10050	00100	00001	600	X
051F4	XXD	00000	04085	00008	20000	00100	00000	610	X
051F4	XXD	00404	04084	00008	30000	00100	00000	614	
051F4	XXM	00000	04085	00008	20000	00100	00000	610	X
051F4	XXM	00000	04085	00008	20000	00100	00000	611	X
051F4	XXM	00000	18C04	00008	04B00	00100	00000	602	
051F4	XXM	00404	04084	00008	30000	00100	00000	614	
051F4	XXM	004C0	04084	00008	30000	00100	00000	616	
051F4	XXM	004C0	04084	00008	30000	00100	00000	624	
051F4	XXM	10800	04494	00008	04000	00100	001FF	614	
051F4	XXT	00000	04085	00008	20000	00100	00000	610	X
051F4	XXT	00404	04084	00008	30000	00100	00000	614	
05212	XXM	00000	04084	00009	20000	00000	00000	151	
05212	XXM	00000	04085	00009	20000	00000	00000	515	X
05212	XXM	00000	04085	00009	20000	00000	00000	612	X
05216	XXD			00009	20000	00000		515	X
05216	XXM			00009	20000	00000		515	X
05216	XXT			00009	20000	00000		515	X
05224	XXD	00000	04084	00009	20000	04000	00000	656	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
05224	XXM	00000	04084	00009	20000	01000	00000	650	
05224	XXM	00000	04084	00009	20000	01000	00000	656	
05224	XXM	00000	04084	00009	20000	04000	00000	650	
05224	XXM	00000	04084	00009	20000	04000	00000	656	
05224	XXM	00000	04084	00009	20000	055AA	00000	608	
05224	XXM	00000	04084	00009	20010	000AA	00000	605	
05224	XXM	00000	04084	0000A	20000	00010	00000	652	
05224	XXM	00000	04084	0000A	20000	00010	00000	656	
05224	XXM	00000	04084	0000A	20000	00040	00000	652	
05224	XXM	00000	04084	0000A	20000	00040	00000	656	
05224	XXT	00000	04084	00009	20000	04000	00000	656	
05224	XXT	00000	04084	00009	20010	000AA	00000	605	
05224	XXT	00000	04084	0000A	20000	00010	00000	656	
05224	XXT	00000	04084	0000A	20000	00040	00000	656	
05224	XXT	00000	04094	00009	20000	01000	00000	656	
052A2	X M X	0C401	04084	18008	20000	0529E	00800	602	
052A2	X M X	0C401	04084	18008	30000	0529E	00800	602	
052A2	X M X	304C2	04414	18008	10000	0529E	00100	650	
052A2	X M X	304C2	04414	18008	10000	0529E	00100	651	
052A2	X T X	0C401	04084	18008	20000	0529E	00800	602	
052A2	X T X	0C401	04084	18008	30000	0529E	00800	602	
052B4	XXD	00000	04085	00009	20000	00100	00000	604	X
052B4	XXD	00000	04085	00009	20000	00100	00000	610	X
052B4	XXD	00000	04085	00009	20000	00100	00000	611	X
052B4	XXD	00000	04085	00009	20010	0552C	00000	605	X
052B4	XXM	00000	04085	00009	20000	00100	00000	604	X
052B4	XXM	00000	04085	00009	20000	00100	00000	610	X
052B4	XXM	00000	04085	00009	20000	00100	00000	611	X
052B4	XXM	00000	04085	00009	20010	0552C	00000	605	X
052B4	XXT	00000	04085	00009	20000	00100	00000	604	X
052B4	XXT	00000	04085	00009	20000	00100	00000	610	X
052B4	XXT	00000	04085	00009	20000	00100	00000	611	X

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
052B4	XXT	00000	04085	00009	20010	0552C	00000	605	X
052BC	XXD	00C01	04484	00008	34000	00100	00000	614	
052BC	XXM	00000	18C04	00008	00000	00000	00000	610	
052BC	XXM	00400	18C04	00008	10000	00000	00000	614	
052BC	XXM	00401	04084	00008	20000	00100	00000	612	
052BC	XXM	004C0	0408C	00008	10000	00100	00000	607	
052BC	XXM	00C01	04084	00008	34000	00100	00000	605	
052BC	XXM	00C01	04484	00008	34000	00100	00000	614	
052BC	XXM	00C01	04484	00009	34000	00100	00000	614	
052BC	XXT	00000	18C04	00008	00000	00000	00000	610	
052BC	XXT	00401	04084	00008	20000	00100	00000	612	
052BC	XXT	004C0	0408C	00008	10000	00100	00000	607	
052BC	XXT	00C01	04084	00008	34000	00100	00000	605	
052BC	XXT	00C01	04484	00008	34000	00100	00000	614	
052E0	XXM	00000	04084	00009	20000	00000	00000	151	
0530C	XXM	00000	04084	00008	20000	01C1C	00000	652	
05330	XXD	00000	04084	00008	20000	1E300	00000	609	
05330	XXM	00000	04084	00008	20000	1E300	00000	609	
05330	XXT	00000	04084	00008	20000	1E300	00000	609	
05374	X M X	00000	18C04	08008	00000	05370	00000	658	
05374	X M X	004C2	00404	08008	10000	05370	00000	613	
05374	X M X	004C2	00404	08008	10000	05370	00000	658	
05374	X M X	004D0	1C404	08008	30010	05370	00000	613	
05374	X M X	024C0	18400	08008	10000	05370	00000	600	
05374	X M X	024C0	18400	08008	10000	05370	00000	624	
05386	XXM	00000	18080	00009	20000	00202	00000	610	
0538C	XXM	00000	18080	00009	20000	00100	00000	651	
0538C	XXM	00000	18080	00009	20000	00200	00000	611	

D1	LSURL	A8	B8	C1	C8	D2	D8	FIG	LOAD
----	-------	----	----	----	----	----	----	-----	------

053FE	X	M	X	CYCLE	04084	3F80C	20000	CYCLE	00000	212
-------	---	---	---	-------	-------	-------	-------	-------	-------	-----

0540C	X	M	X	00000	18C04	08008	00000	05408	00000	658
-------	---	---	---	-------	-------	-------	-------	-------	-------	-----

05424	XXM			00000	18080	00009	20000	00400	00000	651
-------	-----	--	--	-------	-------	-------	-------	-------	-------	-----

05458	X	M	X	004C0	1A400	08008	30010	05454	00000	600
-------	---	---	---	-------	-------	-------	-------	-------	-------	-----

057C6	XXM			00000	18C04	00009	00000	05248	00000	601
-------	-----	--	--	-------	-------	-------	-------	-------	-------	-----

05918	XXM			00000	04084	00009	20000	00200	00000	651
-------	-----	--	--	-------	-------	-------	-------	-------	-------	-----

05918	XXM			00000	04084	00009	20000	00FF0	00000	653
-------	-----	--	--	-------	-------	-------	-------	-------	-------	-----

5-9. S2R FORMATTED LIST. - The following pages contain the data necessary to isolate and correct malfunctions that cause the following conditions:

- 1) an error stop or loop condition with the D1 display equal to 00000 through 001E8 after a successful load from a device connected to Selector Channel 2, or
- 2) an error stop or loop condition during execution of the Selector Channel 2 Test (SELTWO) after a successful load from any channel.

To utilize this data, perform the following steps:

- Step 1. Record hexadecimal values observed in D1, A7, B7, C1, C7, D2, and D7 displays.
- Step 2. Construct LSURL field by means of the following:
 - a) Record an X in left-most L position to designate a successful load.
 - b) Is STOP indicator lit? If yes, record an X in S position; if no (RUN indicator is lit), record an X in right-most L position.
 - c) What loading device was used? If Selector Channel tape unit, record a T in U position; if Selector Channel disc unit, record a D in the U position; if Multiplexer Channel device, record an M in U position.
- Step 3. Construct LOAD field by means of the following:
 - a) Is LOAD WAIT indicator lit? If yes, record an X in L position; if no, leave L position blank.
 - b) Is LOAD NO DATA indicator lit? If yes, record an X in O position; if no, leave O position blank.
 - c) Is LOAD CHECK indicator lit? If yes, record an X in A position; if no, leave A position blank.
 - d) Is LOAD SUBSYSTEM CHECK indicator lit? If yes, record an X in D position; if no, leave D position blank.
- Step 4. Locate corresponding values in S2R formatted list by first matching D1 display value with D1 in list. Then match constructed LSURL field with LSURL column in list. Next match A7 display value with A7 in list, then match B7 display value with B7 in list, etc., ignoring any blank columns. Finally, match constructed LOAD field with LOAD column in list.
- Step 5. Upon locating matching display, record each figure number listed in FIG column for that display.
- Step 6. Refer to figure number/card locator cross reference in Table 5-1, page 5-2, and locate each figure number recorded in Step 5. Then replace specified card(s).

D1	LSURL	A7	B7	C1	C7	D2	D7	FIG	LOAD
050C0	X M X	01C00	0000C	0400B	10000	00200	00100	301	
050CC	XXM	00000	0000C	0040A	00000	00000	00100	310	
05158	XXM	00000	00004	00008	00000	00000	00000	301	
05158	XXM	00000	04084	00008	20000	00100	00000	211	
052CC	XXM	00000	0000C	04009	00000	00000	00100	310	
057BE	X M X	00482	04084	3F80C		CYCLE		212	

ADDITIONAL S2R
INFORMATION NOT AVAILABLE
AT THIS TIME

SECTION 6

9400 DMR PROGRAM LISTINGS

6-1. GENERAL. - This section of the manual contains the side-by-side listings for the 9400 DMR source and object programs. There are eight separate listings, as follows:

- 1) Tape DMR Prelude Program (DMRTOP)
- 2) Disc DMR Prelude Program (DMRDOP)
- 3) Main DMR Program (DMR)
- 4) Communications Adapter Test (COM)
- 5) Limits Register Test (LIMOPT)
- 6) Selector Channel 1 Test (SELONE)
- 7) Selector Channel 2 Test (SELTWO)
- 8) ID Block (IDBLOK)

	SDMR TOP	START USING	0 *,12	REGISTER 12 IS USED AS BASE REG
000001	B1	EQU	1	
000002	B2	EQU	2	
000003	B3	EQU	3	
000004	B4	EQU	4	
000005	B5	EQU	5	
000006	B6	EQU	6	
000007	B7	EQU	7	
000008	B8	EQU	8	
000009	B9	EQU	9	
00000A	B10	EQU	10	
00000B	B11	EQU	11	
00000C	B12	EQU	12	
00000D	B13	EQU	13	
00000E	B14	EQU	14	
00000F	B15	EQU	15	
000000	R0	EQU	0	
000001	R1	EQU	1	
000002	R2	EQU	2	
000003	R3	EQU	3	
000004	R4	EQU	4	
000005	R5	EQU	5	
000006	R6	EQU	6	
000007	R7	EQU	7	
000008	R8	EQU	8	
000009	R9	EQU	9	
00000A	R10	EQU	10	
00000B	R11	EQU	11	
00000C	R12	EQU	12	
00000D	R13	EQU	13	
00000E	R14	EQU	14	
00000F	R15	EQU	15	
000000	S0ABS	EQU	0	
000010	S1ABS	EQU	16	
000020	S2ABS	EQU	32	
000030	S3ABS	EQU	48	
000040	S4ABS	EQU	64	
000050	S5ABS	EQU	80	
000060	S6ABS	EQU	96	
000070	S7ABS	EQU	112	
000080	S8ABS	EQU	128	
000090	S9ABS	EQU	144	

0000A0	S10ABS	EQU	160	
0000B0	S11ABS	EQU	176	
0000C0	S12ABS	EQU	192	
0000D0	S13ABS	EQU	208	
0000E0	S14ABS	EQU	224	
0000F0	S15ABS	EQU	240	
* * * * *				
000008	OSVPSW	EQU	X'008'	
000018	OPRPSW	EQU	X'018'	
000028	OTMPSW	EQU	X'028'	
000038	OMSPSW	EQU	X'038'	
000048	OMNPSW	EQU	X'048'	
000058	OS1PSW	EQU	X'058'	
000068	OS2PSW	EQU	X'068'	
000078	ONUPSW	EQU	X'078'	
000088	NSVPSW	EQU	X'088'	
000098	NPRPSW	EQU	X'098'	
0000A8	NTMPSW	EQU	X'0A8'	
0000B8	NMSPSW	EQU	X'0B8'	
0000C8	NMNPSW	EQU	X'0C8'	
0000D8	NS1PSW	EQU	X'0D8'	
0000E8	NS2PSW	EQU	X'0E8'	
000114	IPLBCW	EQU	X'114'	
000190	TCW	EQU	X'190'	
0001A0	CSW1	EQU	X'1A0'	
0001A8	CSW2	EQU	X'1A8'	
* * * * *				
000008	ZERO	EQU	8	
000007	NONZ	EQU	7	
000004	LSZ	EQU	4	
00000C	LEZ	EQU	12	
000002	GTZ	EQU	2	
00000A	GEZ	EQU	10	
000008	EQL	EQU	8	
000007	NEQ	EQU	7	
00000F	UNCOND	EQU	15	
000004	MIXED	EQU	4	
000001	ONES	EQU	1	
00000E	NONES	EQU	14	
000007	NZERO	EQU	7	
000004	NEG	EQU	4	
000002	POSIT	EQU	2	
000E10	MXBCW1	EQU	3600	
000E20	LODR13	EQU	3616	

CC FOR POSITIVE
 CC FOR NEGATIVE
 CC FOR NON-ZERO
 TEMP STORAGE
 TEMP STORAGE

	000E24		LODR14	EQU	3620	TEMP STORAGE
	000E28		LODR15	EQU	3624	TEMP STORAGE
	000E2C		EXTRA	EQU	3628	TEMP STORAGE
			* * * * *	* * * * *	* * * * *	* * * * *
000000	99 00 0 000			HPR	0(0)	* PRELUDE ERROR STOP, SUPV REG 0
000004	00000000			DC	X'00000000'	PROBLEM REGISTER 0
000008	00000000 00000000			DC	XL8'00000000'	OLD SUPERVISOR PSW
000010	00000444			DC	A(CCNUT0)	SUPERVISOR REGISTER 1
000014	00000000			DC	X'00000000'	PROBLEM REGISTER 1
000018	00000000 00000000			DC	XL8'00000000'	OLD PROGRAM PSW
000020	0000045C			DC	A(BRANCH)	SUPERVISOR REGISTER 2
000024	000000FF	FF		DC	X'000000FF'	
000028	00000000 00000000			DC	XL8'00000000'	OLD TIMER PSW
000030	00000450			DC	A(CCODE1)	SUPERVISOR REGISTER 3
000034	0000FF00	FF00		DC	X'0000FF00'	
000038	0000FFFF			DC	2X'0000FFFF'	OLD MPX SHARED PSW
	0000FFFF					
000040	00000000			DC	X'00000000'	SUPERVISOR REGISTER 4
000044	9C00F000	XQTS10		DC	X'9C00F000'	START I/O INSTRUCTION
000048	00000000 00000000			DC	XL8'00000000'	OLD MPX NON-SHARED PSW
000050	FFFFFFFF			DC	X'FFFFFFFF'	SUPERVISOR REGISTER 5
000054	47F00F04	JMPF04		DC	X'47F00F04'	WAIT AT F04 FOR INTERRUPT
000058	0000FFFF			DC	2X'0000FFFF'	OLD SELECTOR CHAN #1 PSW
	0000FFFF					
000060	00000458			DC	A(LINK)	SUPERVISOR REGISTER 6
000064	00000000			DC	X'00000000'	PROBLEM REGISTER 6
000068	0000FFFF			DC	2X'0000FFFF'	OLD SELECTOR CHAN #2 PSW
	0000FFFF					
000070	0000044C			DC	A(CCODE2)	SUPERVISOR REGISTER 7
000074	00000000			DC	X'00000000'	PROBLEM REGISTER 7
000078	00000000 00000000			DC	XL8'00000000'	UNUSED OLD PSW LOCATION
000080	00000000			DC	X'00000000'	SUPERVISOR REGISTER 8
000084	00000000			DC	X'00000000'	PROBLEM REGISTER 8
000088	00000000			DC	X'00000000'	NEW SUPERVISOR PSW
00008C	0000042A			DC	A(PRESVC)	ERROR-LOOP ADDRESS FOR PRELUDE
000090	00000004			DC	X'00000004'	SUPERVISOR REGISTER 9
000094	00000000			DC	X'00000000'	PROBLEM REGISTER 9
000098	00000000			DC	X'00000000'	NEW PROGRAM PSW
00009C	000001F0			DC	A(HPR98)	ERROR STOP ADDRESS FOR PRELUDE
0000A0	10000000			DC	X'10000000'	SUPERVISOR REGISTER 10
0000A4	00000000			DC	X'00000000'	PROBLEM REGISTER 10
0000A8	00000000			DC	X'00000000'	NEW TIMER PSW
0000AC	000001F4			DC	A(HPRA8)	ERROR STOP ADDRESS FOR PRELUDE
0000B0	20000000			DC	X'20000000'	SUPERVISOR REGISTER 11

0000B4	00000000		DC	X'00000000'	PROBLEM REGISTER 11
0000B8	08000000		DC	X'08000000'	NEW MPX-SHARED PSW
0000BC	30		DC	X'30'	SET CC TO 3 ON INTERRUPT
0000B0	000400		DC	AL3(PREDMR)	PRELUDE STARTING ADDRESS
0000C0	00000000		DC	X'00000000'	SUPERVISOR REGISTER 12
0000C4	00000000		DC	X'00000000'	PROBLEM REGISTER 12
0000C8	00000000		DC	X'00000000'	NEW MPX NON-SHARED PSW
0000CC	000001F8		DC	A(HPRC8)	ERROR STOP ADDRESS FOR PRELUDE
0000D0	00000408		DC	A(PREBCX)	SUPERVISOR REGISTER 13
0000D4	00000001	PLUS1	DC	X'00000001'	
0000D8	20000000		DC	X'20000000'	NEW SELECTOR CHANNEL 1 PSW
0000DC	30		DC	X'30'	SET CC TO ZERO ON INTERRUPT
0000DD	000400		DC	AL3(PREDMR)	PRELUDE STARTING ADDRESS
0000E0	30000000		DC	X'30000000'	SUPERVISOR REGISTER 14
0000E4	0000FFFF	SXONES	DC	X'0000FFFF'	
0000E8	10000000		DC	X'10000000'	NEW SELECTOR CHANNEL 2 PSW
0000EC	30		DC	X'30'	SET CC TO ZERO ON INTERRUPT
0000ED	000400		DC	AL3(PREDMR)	PRELUDE STARTING ADDRESS
0000F0	0000048C		DC	A(LTRCC1)	SUPERVISOR REGISTER 15
0000F4	00000000		DC	X'00000000'	PROBLEM REGISTER 15
0000F8	00000000		DC	X'00000000'	UNUSED NEW PSW LOCATION
0000FC	000001FC		DC	A(HPRF8)	ERROR STOP ADDRESS FOR PRELUDE
000100	00800000		DC	X'00800000'	CONSOLE SHARED SCW
000104	00000000		DC	3X'00000000'	HARDWARE STORAGE LOCATIONS
	00000000				
	00000000				
000110	00000114		DC	X'00000114'	MPX SHARED SCW #1
000114	EEA00118		DC	X'EEA00118'	INITIAL LOAD BCW
000118	FF000000	STSAND	DC	X'FF000000'	CONSTANT TO GET STATUS CODES
00011C	0C000000	STATUS	DC	X'0C000000'	EXPECTED STATUS/SIO
000120	00000114		DC	X'00000114'	MPX SHARED SCW #2
000124	00000010	NEXTBL	DC	F'16'	FOUR-WORD INCREMENT
000128	38000000	ANYPSW	DC	X'38000000'	
00012C	30000000		DC	X'30000000'	
000130	00000114		DC	X'00000114'	MPX SHARED SCW #3
000134	FFFFFFFF	ENTRY1	DC	X'FFFFFFFF'	LOADER INFORMATION TABLES
000138	00000005		DC	X'00000005'	NUMBER OF 3600 BYTE BLOCKS
00013C	00001000		DC	X'00001000'	DMR... LOAD ADDRESS
000140	00000114		DC	X'00000114'	MPX SHARED SCW #4
000144	FFFFFFFF	ENTRY2	DC	X'FFFFFFFF'	LOAD FLAG...00000000 IF LOADED
000148	00000001		DC	X'00000001'	NUMBER OF 3600 BYTE BLOCKS
00014C	00005000		DC	X'00005000'	LOAD ADR...ENTRY 2
000150	00000114		DC	X'00000114'	MPX SHARED SCW #5
000154	FFFFFFFF	ENTRY3	DC	X'FFFFFFFF'	LOAD FLAG...00000000 IF LOADED

000158	00000001	DC	X'00000001'	NUMBER OF 3600 BYTE BLOCKS
00015C	00005000	DC	X'00005000'	OPTION LOAD ADDRESS
000160	00000114	DC	X'00000114'	MPX SHARED SCW #6
000164	FFFFFFFF	ENTRY4	X'FFFFFFFF'	LOAD FLAG...00000000 IF LOADED
000168	00000001	DC	X'00000001'	NUMBER OF 3600 BYTE BLOCKS
00016C	00005000	DC	X'00005000'	OPTION LOAD ADDRESS
000170	00000114	DC	X'00000114'	MPX SHARED SCW #7
000174	FFFFFFFF	ENTRY5	X'FFFFFFFF'	LOAD FLAG...00000000 IF LOADED
000178	00000001	DC	X'00000001'	NUMBER OF 3600 BYTE BLOCKS
00017C	00005000	DC	X'00005000'	OPTION LOAD ADDRESS
000180	00800000	DC	X'00800000'	MPX NON-SHARED STATUS SCW
000184	00000184	ENTRY6	A(ENTRY6)	NO MORE OPTIONS...LOAD MAR NOW
000188	00000134	PTABLE	A(ENTRY1)	LOAD TABLE ADDRESS (START)
00018C	00000134	BASEXP	A(ENTRY1)	LOAD TABLE ADDRESS (POINTER)
000190	00800000	DC	X'00800000'	TIMER SCW
000194	C4D4D9F1	MARIDS	C'DMR1'	PRE-MAR ID FOR LOAD
000198	00000E10	RECORD	X'00000E10'	HEX FOR 3600 BYTE COUNT
00019C	FFFFFFFF	MINUS1	X'FFFFFFFF'	
0001A0	00000000 00000000	DC	XL8'00000000'	SELECTOR CHAN #1 CSW
0001A8	00000000 00000000	DC	XL8'00000000'	SELECTOR CHAN #2 CSW
0001B0	FFFF0000	FFFFZZ	X'FFFF0000'	

* LOADER ERROR STOP				

0001B4	99 00 4 000	STSERR	HPR 0(R4)	* STATUS ERROR IN CSW
0001B8	47 F 0 C 1B8		BC 15,*	
0001BC	99 00 4 000	CMDERR	HPR 0(R4)	* CMD STORED WRONG IN CSW
0001C0	47 F 0 C 1C0		BC 15,*	
0001C4	99 00 4 000	CCWERR	HPR 0(R4)	* CCW ADR WRONG IN CSW
0001C8	47 F 0 C 1C8		BC 15,*	
0001CC	00008008	FZEA	DC X'00008008'	
0001D0	00800800	SZEA	DC X'00800800'	
0001D4	00000FFF	OFFF	DC X'00000FFF'	PATTERN FOR LOAD ADDRESS TEST
0001D8	00001111	ZERONE	DC X'00001111'	
0001DC	00008888	ZROEGT	DC X'00008888'	
0001E0	00020000	TWOK	DC X'00020000'	CYLINDER 02, TRACK 00
0001E4	8888CCCC	EIGHTC	DC X'8888CCCC'	
0001E8	FF0000FF	FZZF	DC X'FF0000FF'	
0001EC	99 00 0 088	HPR88	HPR 136(0)	* SUPERVISOR PSW SWAP ERROR
0001F0	99 00 0 098	HPR98	HPR 152(0)	* PROGRAM PSW SWAP ERROR
0001F4	99 00 0 0A8	HPRA8	HPR 168(0)	* TIMER PSW SWAP ERROR
0001F8	99 00 0 0C8	HPRC8	HPR 200(0)	* MPX NON-SHARED PSW SWAP ERROR
0001FC	99 00 0 0F8	HPRF8	HPR 248(0)	* UNUSED PSW SWAP ERROR
	000200	ORG	SDMRTOP+512	SET ADDRESS TO HEX 200

```

000200 45 8 0 C 9A2
000204 58 C 0 0 B04
000208 58 1 0 C 188
00020C 50 1 0 C 18C
000210 47 F 0 C 21C
000214 58 C 0 0 B04
000218 58 0 0 0 E20
00021C 58 E 0 0 E24
000220 58 F 0 0 E28
000224 58 1 0 C 18C
000228 59 1 0 C 184
00022C 47 A 0 C 354
000230 58 2 0 1 000
000234 12 2 2
000236 47 8 0 C 25A
00023A 18 2 2
00023C 50 2 0 1 000
000240 18 6 2
000242 58 8 0 1 004
000246 58 9 0 1 008
00024A 18 5 9
00024C 18 7 9
00024E 5A 1 0 C 124
000252 50 1 0 C 18C
000256 47 F 0 C 266
00025A 5A 1 0 C 124
00025E 50 1 0 C 18C
000262 47 F 0 C 214
000266 12 E E
000268 47 7 0 C 208

```

```

*****
*                               LOADER SCHEDULER ROUTINE
*****
BAL      R8,SIOCHK      LOAD MARS IMMEDIATELY
SCAN     L      R12,ZEROS(,0)  REGISTER 12 IS USED AS A BASE
        L      R1,PTABLE      PICKUP ADDRESS OF FIRST TABLE
        ST     R1,BASEXP      STORE IN TABLE POINTER
        BC     15,SCAND+8     SKIP OVER SSM IF PRELUDE
SCAN0    L      R12,ZEROS(,0)  CLEAR BASE REGISTER
        L      R13,LODR13     PICKUP CSW ADR
        L      R14,LODR14     PICKUP SCW ADR
        L      R15,LODR15     PICKUP CHN/DEV
        C      R1,ENTRY6      GET TABLE POINTER
        BC     10,MARLOD
SCAN1    L      R2,0(,R1)      PICKUP FIRST WORD
        LTR     R2,R2          IF FFFFFFFF,CONTINUE
        BC     8,SCAN2        ZERO, GET NEXT TABLE
        SR      R2,R2          CLEAR R2
        ST     R2,0(,R1)      CLEAR FIRST WORD/TBL
        LR      R6,R2          CLEAR R6 FOR I/O USE
        L      R8,4(,R1)      GET 2ND WORD= #BLOCKS
        L      R9,8(,R1)      GET 3RD WORD= ADDRESS
        LR      R5,R9          SAVE ADDRESS FOR XQT
        LR      R7,R9          SAVE FOR POINTER/LOAD
        A      R1,NEXTBL      INCREMENT THE TABLE POINTER
        ST     R1,BASEXP      SAVE THE VALUE FOR NEXT LOAD
        BC     15,CHANYL      EXIT TO THE LOAD=SETUP ROUTINE
SCAN2    A      R1,NEXTBL      INCREMENT THE TABLE POINTER
        ST     R1,BASEXP      SAVE THE VALUE TO TRY AGAIN
        BC     15,SCAND        TRY AGAIN FOR ANY LOADS TO DO
CHANYL   LTR     R14,R14       TEST FOR ANY MUX=SCW ADDRESS
        BC     NONZ,MPXLOD     NON=ZERO = MUX LOAD FROM 6CIS
*****
*                               LOADER SELECTOR CHANNEL I/O SETUP
*****
SELOAD   LA      R0,CCWS      CCW ADDRESSES TO CAW
        L      R1,CCWS      GET CMD/ADDRESS HALF OF CCW
        N      R1,STSAND     AND=OUT THE ADDRESS PORTION
        OR     R1,R9         OR=ON THE NEW ADDRESS
        ST     R1,CCWS      SAVE THE NEW CCW
        L      R1,SELPSW     SELECTOR CHANNEL PSW
        L      R2,SELPSW+4   INTERRUPT RETURN ADDRESS
        LA     R0,CCWS      CCW ADDRESS TO R0

```

```

00026C 41 0 0 C 348
000270 58 1 0 C 348
000274 54 1 0 C 118
000278 16 1 9
00027A 50 1 0 C 348
00027E 58 1 0 C 340
000282 58 2 0 C 344
000286 41 0 0 C 348

```



```

00028A 50 1 0 0 0B8
00028E 50 1 0 0 0D8
000292 50 1 0 0 0EA
000296 50 2 0 0 0BC
00029A 50 2 0 0 0DC
00029E 50 2 0 0 0EC
0002A2 80 00 C 128
0002A6 47 F 0 0 F00

```

```

0002AA 58 1 0 0 004
0002AE 54 1 0 C 118
0002B2 59 1 0 C 11C
0002B6 47 7 0 C 184
0002BA 58 1 0 C 194
0002BE 59 1 0 9 000
0002C2 47 8 0 C 364
0002C6 5A 9 0 C 198
0002CA 58 8 0 C 178
0002CE 12 8 8
0002D0 47 7 0 C 266
0002D4 47 F 0 5 000

```

```

0002D8 41 6 0 C 350
0002DC 50 6 0 F 000
0002E0 58 1 0 C 350
0002E4 54 1 0 C 1B0
0002E8 16 1 9
0002EA 50 1 0 C 350
0002EE 58 1 0 C 338
0002F2 58 2 0 C 33C
0002F6 41 0 0 0 002
0002FA 47 F 0 C 28A
0002FE 58 1 0 F 000
000302 47 F 0 C 2AE
        000330

```

```

000330 00000000

```

```

*****
*                               LOADER I/O INITIATION                               *
*****
LODSIO  ST      R1,NMSPSW      SAVE NEW PSW DESIRED (MPX)
        ST      R1,NS1PSW     SAVE NEW PSW DESIRED (SEL 1)
        ST      R1,NS2PSW     SAVE NEW PSW DESIRED (SEL 2)
        ST      R2,NMSPSW+4    SAVE INTERRUPT RETURN ADDRESS
        ST      R2,NS1PSW+4    SAVE INTERRUPT RETURN ADDRESS
        ST      R2,NS2PSW+4    SAVE INTERRUPT RETURN ADDRESS
        SSM     ANYPSW        ENABLE MPX=SH/SEL 1/SEL 2 I/O
        BC      15,3840       GO ISSUE SIO TO DEVICE (R15)
*****
*                               LOADER INTERRUPT HANDLING/STATUS CHECKING           *
*****
SELRET  L      R1,4(,R13)     PICKUP STATUS FROM CSW
MPXINP  N      R1,STSAND      AND-OUT GARBAGE (MPX ENTRY)
        C      R1,STATUS      EXPECTED STATUS ?
        BC     NEQ,STSERR     BRANCH IF ERROR STATUS
        L      R1,MARIDS      PREMAR IDENTIFIER CODE
        C      R1,0(,R9)      FIRST WORD OF NEW BLOCK = ID ?
        BC     EQL,GOTMAR     BRANCH IF ID FOUND
        A      R9,RECORD      ADD RECORD LENGTH/ADR
        S      R8,ENTRY5+4    DECREMENT BLOCK COUNT
        LTR    R8,R8          ZERO = NO MORE...
        BC     7,CHANYL      STILL MORE...CONTINUE
        BC     15,0(,R5)
*****
*                               LOADER MULTIPLEX CHANNEL I/O SETUP                   *
*****
MPXL0D  LA      R6,MPXBCW      GET BCW ADDRESS
        ST      R6,0(,R14)     STORE BCW ADDRESS IN SCW
        L      R1,MPXBCW      GET BYTE COUNT,DATA ADR
        N      R1,FFFFZZ      AND-OUT THE ADDRESS
        OR     R1,R9          OR-IN NEW ADR
        ST      R1,MPXBCW      SAVE NEW BCW
        L      R1,MPXPSW      NEW PSW DESIRED
        L      R2,MPXPSW+4    INTERRUPT RETURN ADDRESS
        LA     R0,2           READ COMMAND TO CAW
        BC     15,LODSIO      INITIATE I/O
MPXRET  L      R1,0(,R14)     GET STATUS FROM SCW
        BC     15,MPXINP      CHECK STATUS,DATA
        ORG    $DMRTOP+816    SET ADDRESS TO HEX 330
*
        DC     F'0'          ALIGN ON A FULL-WORD BOUNDARY

```

000334 0700 0700
 000338 08000000 30
 00033D 0002FE
 000340 30000000 30
 000345 0002AA
 000348 02000000
 00034C 00000E10
 000350 E1000000

000354 58 8 0 C 124
 000358 58 9 0 C 13C
 00035C 50 8 0 C 198
 000360 47 F 0 C 266
 000364 80 00 C 128
 000368 98 0 3 C 818
 00036C 90 1 2 0 088
 000370 50 3 0 0 100
 000374 9C 00 0 080
 000378 47 F 0 C 378
 00037C 58 8 0 C 004
 000380 41 0 0 0 002
 000384 50 C 0 0 114
 000388 41 1 0 0 114
 00038C 50 1 0 E 000
 000390 12 0 0
 000392 47 8 0 0 F00
 000396 58 1 0 C 348
 00039A 54 1 0 C 118
 00039E 50 1 0 C 348
 0003A2 41 0 0 C 348
 0003A6 47 F 0 0 F00

	CNOP	0,8	ALIGN ON A DOUBLE-WORD BOUNDARY
MPXPSW	DC	X'0800000030'	MULTIPLEX CHANNEL PSW
	DC	AL3(MPXRET)	INTERRUPT RETURN ADDRESS
SELPSW	DC	X'3000000030'	SELECTOR CHANNEL PSW
	DC	AL3(SELRET)	INTERRUPT RETURN ADDRESS
CCWS	DC	X'02000000'	COMMAND, DATA ADDRESS
	DC	X'00000E10'	BYTE COUNT (NO CHAINING)
MPXBCW	DC	X'E1000000'	BCW COUNT FOR MPX CHANNEL

 * LOADER PREMAR FIND/LOAD ROUTINE

MARLOD	L	R8,NEXTBL	SET LARGE BLOCK COUNT/FIND MARS
	L	R9,ENTRY1+8	LOAD INTO ADDRESS 1000
	ST	R8,RECORD	SHORTEN POINTER/MIN MEMORY
	BC	UNCOND,CHANYL	GO RUN THE LOAD ROUTINE
GOTMAR	SSM	ANYP SW	SETUP *END DMR* CONSOLE MESSAGE
	LM	R0,R3,MSGDMR	SETUP I/O CONSTANTS
	STM	R1,R2,NMSPSW	RETURN TO LOADER FOR MARS
	ST	R3,256	SAVE CONSOLE SCW
	SIO	128(0)	SEND MSG TO CONSOLE
	BC	15,*	WAIT FOR INTERRUPT
LODMAR	L	R8,PLUS1	PRE-MAR IDENTIFIER IS LOADED
	LA	R0,2	LOAD CAW WITH READ CMD
	ST	R12,276	STORE ZERO IN ADR 114
	LA	R1,276	ADR 114 IS BCW (ALL ZERO)
	ST	R1,0(,R14)	STORE IN SCW
	LTR	R13,R13	I/O TO SELECTOR CHANNEL?
	BC	8,3840	NO
	L	R1,CCWS	GET SELECTOR CHANNEL READ
	N	R1,STSAND	AND-OUT ADDRESS
	ST	R1,CCWS	LOAD INTO ADDRESS ZERO
	LA	R0,CCWS	GET CCW ADDRESS TO CAW FOR SIO
	BC	15,3840	GO EXECUTE SIO

000400				EJECT ORG	SDMRTP+1024	SET ADDRESS TO HEX 400

* BEGINNING OF 9400 DMR PRELUDE						

000400	99 00	0 A0A	PREDMR	HPR	2570(0)	• HALT BEFORE ENTERING PRELUDE
000404	47 8 0	C 42C		BC	8,PRES PM	OPERATOR SHOULD SET CC TO 3
000408	07 8 0		PREBCX	BCR	8,R13	• ERROR BC/HPR FAILED FORCE LOOP
00040A	07 4 0			BCR	4,R13	• ERROR BC/HPR FAILED FORCE LOOP
00040C	07 2 0			BCR	2,R13	• ERROR BC/HPR FAILED FORCE LOOP
00040E	07 1 0			BCR	1,R13	• ERROR BC/HPR FAILED FORCE LOOP
000410	07 F 0			BCR	15,R13	• ERROR BC/HPR FAILED FORCE LOOP
000412	47 1 0	C 412		BC	1,*	• ERROR BC/HPR FAILED FORCE LOOP
000416	47 2 0	C 416		BC	2,*	• ERROR BC/HPR FAILED FORCE LOOP
00041A	47 4 0	C 41A		BC	4,*	• ERROR BC/HPR FAILED FORCE LOOP
00041E	45 0 0	C 41E		BAL	R13,*	• ERROR BC/HPR FAILED FORCE LOOP
000422	47 F 0	C 422		BC	15,*	• ERROR BC/HPR FAILED FORCE LOOP
000426	82 00	C 426		LPSW	*	• ERROR BC/HPR FAILED FORCE LOOP
00042A	0A 0F		PRESVC	SVC	15	• ERROR BC/HPR FAILED FORCE LOOP
00042C	04 9 0		PRES PM	SPM	R9	CONDITION CODE SHOULD REMAIN 0
00042E	07 7 1			BCR	7,R1	CONDITION CODE ZERO, NO BRANCH
000430	07 8 2			BCR	8,R2	BRANCH WITH CC EQUAL ZERO
000432	04 8 0			SPM	R11	NO BRANCH, SET CC TO 2
000434	07 2 7			BCR	2,R7	WILL A BRANCH OCCUR WITH CC = 2
000436	04 A 0			SPM	R10	NO BRANCH, SET CC TO 1
000438	07 4 3			BCR	4,R3	WILL A BRANCH WITH CC = 1 WORK
00043A	47 4 0	0 454		BC	4,CONDC1(0,0)	NO, WILL A F OF 47 FUNCTION
00043E	05 4 6			BALR	R4,R6	NO, TRY A BRANCH AND LINK
000440	99 00	C 440		HPR		• NO BRANCH WILL FUNCTION
000444	12 4 4		CCNOTO	LTR	R4,R4	SET CONDITION CODE TO 0
000446	07 7 F			BCR	7,R15	IS CONDITION CODE ZERO
000448	99 00	C 448		HPR		• NO, CONDITION CODE WONT CLEAR
00044C	99 00	C 44C	CCODE2	HPR		• BRANCH WITH CC = 2 FUNCTIONS
000450	99 00	C 450	CCODE1	HPR		• BRANCH WITH CC = 1 FUNCTIONS
000454	99 00	C 454	CONDC1	HPR		• BC WITH CC = 1 FUNCTIONS
000458	99 00	C 458	LINK	HPR		• BALR DOES BRANCH
00045C	07 0 6		BRANCH	BCR	0,R6	NO-OP SHOULD NOT BRANCH, R1 = 0
00045E	07 8 0			BCR	8,R0	NO-OP SHOULD NOT BRANCH, R2 = 0
000460	47 8 0	0 468	BCCCO	BC	8,BZONE(0,0)	CHECK F EQUAL 47, CC STILL 0
000464	99 00	C 464		HPR		• NO BRANCH
000468	47 8 0	9 46C	BZONE	BC	8,B2ZERO(0,R9)	CHECK F EQUAL 47, B2 EQUAL 4
00046C	99 00	C 46C	B2ZERO	HPR		• B2 DIDNT INCREMENT BRANCH ADDR
000470	04 A 0		CCTO1	SPM	R10	CHANGE CONDITION CODE TO 1

```

000472 47 8 0 C 482
000476 47 3 0 C 490
00047A 47 4 0 C 494
00047E 99 00 C 47E
000482 12 4 5
000484 47 4 0 C 48C
000488 99 00 C 488
00048C 99 00 C 48C
000490 99 00 C 490
000494 04 8 0
000496 47 0 0 C 4A2
00049A 47 2 0 C 4A6
00049E 99 00 C 49E
0004A2 99 00 C 4A2
0004A6 04 E 0
0004A8 47 1 0 C 4B0
0004AC 99 00 C 4AC
0004B0 12 4 5
0004B2 47 4 0 C 4D4
0004B6 47 1 0 C 4C8
0004BA 47 8 0 C 4CC
0004BE 19 1 5
0004C0 47 8 0 C 4D0
0004C4 99 00 C 4C4
0004C8 99 00 C 4C8
0004CC 99 00 C 4CC
0004D0 99 00 C 4D0
0004D4 12 4 4
0004D6 47 4 0 C 4E6
0004DA 47 2 0 C 4E2
0004DE 99 00 C 4DE
0004E2 99 00 C 4E2
0004E6 12 4 8
0004E8 47 8 0 C 4F0
0004EC 99 00 C 4EC
0004F0 12 4 9
0004F2 47 2 0 C 4FA
0004F6 99 00 C 4F6
0004FA 12 4 4
0004FC 47 2 0 C 504
000500 99 00 C 500
000504 19 8 8
000506 47 8 0 C 510
00050A 18 8 8

```

```

JPIF0 BC 8,JPIF0
BC 3,JPIF23
BC 4,CCT02
LTR R4,R5
BC 4,LTRCC1
HPR
LTRCC1 HPR
JPIF23 HPR
CCT02 SPM
BC R11
BC 13,JPIF13
HPR 2,CCT03
JPIF13 HPR
CCT03 SPM
BC R14
HPR 1,LOADR
LTR R4,R5
BC 4,LOADR1
BC 1,LOADR2
BC 8,LOADR3
CR R1,R5
BC 8,LOADR4
HPR
LOADR2 HPR
LOADR3 HPR
LOADR4 HPR
LOADR1 LTR
BC R4,R4
BC 4,LOADR0
BC 2,LOADR5
HPR
LOADR5 HPR
LOADR0 LTR
BC R4,R8
BC 8,LOADR9
HPR
LOADR9 LTR
BC R4,R9
HPR 2,LOADR6
LOADR6 LTR
BC R4,R4
BC 2,COMPR
HPR
COMPR CR R8,R8
BC 8,COMPR1
SR R8,R8

```

```

HAS CONDITION CODE CHANGED?
YES, IS IT 2 OR 3?
BRANCH IF CC EQUALS 1
• NO BRANCH
  SET CONDITION CODE TO 1
  BRANCH IF LTR SETS CC TO 1
• PO 35 WILL NOT SET
• PO 35 SET BY LTR BUT NOT BY SPM
• CONDITION CODE EQUALS 2 OR 3
  SET CONDITION CODE TO 2
  IS CONDITION CODE 1 OR 3?
  NO, CHECK FOR CONDITION CODE 2
• PO 34 NOT SET
• PO 35 NOT CLEARED OR WAS SET
  SET CONDITION CODE TO 3
  IS CONDITION CODE = 3?
• NO, CONDITION CODE 0,1 OR 2
  SET CC TO 1, R5 EQUALS -1
  DOES CC EQUAL 1?
  DOES CC STILL EQUAL 3?
  DOES CC EQUAL 0?
  SET CC TO 2, R1 > R5
  BRANCH IF CC ZERO
• CC NOT SET BY COMPARE OR LTR
• CC WAS NOT CLEARED OR SET RIGHT
• CC WAS CLEARED BUT DIDNT RESET
• CC EQUALLED ZERO AFTER CR R1>R5
  WAS R4 LOADED WITH A NEGATIVE #
  CHECK CC WHICH SHOULD EQUAL 1
  CC DOESNT = 1, CHECK FOR POS #
• R4 EQUAL ZERO OR CC WOULDNT SET
• R4 POS, OR CC SET INCORRECTLY
  CC SHOULD BE 0, R8 EQUALS 0
  CHECK FOR CC = 0
• CC NOT SET TO ZERO
  SET CC TO 2, R9 EQUALS 4
  WAS CC SET TO 2 BY LTR?
• NO, ADDER OR PO 34 ENABLE ERROR
  WAS R4 LOADED WITH A POSITIVE #
  DOES CC = 0
• NO, ADDER ERROR
  COMPARE R8 WITH R8, R8 EQUALS 0
  CC SHOULD EQUAL 0
  CC DOESNT EQUAL 0, SUBTRACT R8

```

```

00050C 99 00 8 000
000510 19 5 5
000512 47 8 0 C 51C
000516 18 5 5
000518 99 00 5 000
00051C 19 8 9
00051E 47 4 0 C 526
000522 99 00 C 522
000526 19 9 8
000528 47 2 0 C 530
00052C 99 00 C 52C
000530 59 8 0 C 804
000534 47 8 0 C 53C
000538 99 00 C 538
00053C 59 8 9 0 804
000540 47 4 0 C 548
000544 99 00 C 544
000548 59 9 8 0 804
00054C 47 2 0 C 554
000550 99 00 C 550
000554 58 4 0 C 19C
000558 19 4 5
00055A 47 8 0 C 562
00055E 99 00 C 55E
000562 58 4 0 C 804
000566 19 4 8
000568 47 8 0 C 570
00056C 99 00 C 56C
000570 18 4 5
000572 59 4 0 C 19C
000576 47 8 0 C 57E
00057A 99 00 C 57A
00057E 18 4 8
000580 59 4 0 C 804
000584 47 8 0 C 58C
000588 99 00 C 588
00058C 1A 4 5
00058E 19 4 5
000590 47 7 0 C 58A
000594 1A 4 8
000596 19 4 5
000598 47 8 0 C 5A0
00059C 99 00 C 59C
0005A0 18 4 8

```

```

COMPR1 HPR 0(R8)
CR R5,R5
BC 8,COMPR2
SR R5,R5
HPR 0(R5)
COMPR2 CR R8,R9
BC 4,COMPR3
HPR
COMPR3 CR R9,R8
BC 2,COMP
HPR
COMP C R8,ZEROS
BC 8,COMP1
HPR
COMP1 C R8,ZEROS(R9,0)
BC 4,COMP2
HPR
COMP2 C R9,ZEROS(R8,0)
BC 2,LOAD
HPR
LOAD L R4,MINUS1
CR R4,R5
BC 8,LOAD1
HPR
LOAD1 L R4,ZEROS
CR R4,R8
BC 8,LOADR7
HPR
LOADR7 LR R4,R5
C R4,MINUS1
BC 8,LOADR8
HPR
LOADR8 LR R4,R8
C R4,ZEROS
BC 8,ADD
HPR
ADD AR R4,R5
CR R4,R5
BC NZERO,ERR
AR R4,R8
CR R4,R5
BC ZERO,AR1
HPR
AR1 LR R4,R8

```

- FROM R8, DISPLAY RESULT IN A0.
COMPARE MINUS ONE AND MINUS ONE
CC SHOULD EQUAL ZERO
CC DOESNT EQUAL ZERO
- DISPLAY DIFFERENCE IN A0
R8 = 0 . R9 = 4
CC SHOULD EQUAL 1
• CC DID NOT SET PROPERLY
R9 = 4 > R8 = 0
CC SHOULD EQUAL 2
- CC WAS NOT SET CORRECTLY
CHECK RX COMPARE
CC SHOULD BE ZERO
- CC IMPROPERLY SET
COMPARE 0 WITH 4 (R9=4)
CC SHOULD EQUAL 1
- PO 35 WAS NOT SET
COMPARE 4 WITH 0 (R8=0)
CC SHOULD EQUAL 2
- PO 34 WAS NOT SET
LOAD R4 WITH MINUS ONE
WAS R4 LOADED CORRECTLY?
CC SHOULD EQUAL 0
- R4 WAS NOT LOADED WITH MINUS 1
LOAD R4 WITH ZERO
WAS R4 LOADED CORRECTLY?
CC SHOULD EQUAL 0
- R4 DOES NOT EQUAL ZERO
LOAD R4 WITH MINUS ONE
WAS R4 LOADED CORRECTLY
CC SHOULD EQUAL 0
- R4 INCORRECTLY LOADED
LOAD R4 WITH ZERO
COMPARE R4 WITH ZERO
CC SHOULD EQUAL 0
- R4 WAS NOT ZERO
ADD, D=FFFF, B=ZEROS
TOTAL EQUAL FFFF
ADDITION NOT CORRECT
ADD, D=ZEROS, B=+FFF
TOTAL EQUAL FFFF
CONTINUE TEST
- 0+F ADDS, F+0 DOESN'T
CLEAR R4

```

0005A2 1A 4 8
0005A4 47 8 0 C 5AC
0005A8 99 00 C 5A8
0005AC 5A 4 0 C 19C
0005B0 19 4 5
0005B2 47 8 0 C 5EC
0005B6 99 00 C 5B6
0005BA 18 4 8
0005BC 5A 4 0 C 804
0005C0 19 4 5
0005C2 47 8 0 C 5E4
0005C6 18 4 5
0005C8 1A 4 8
0005CA 19 4 5
0005CC 47 8 0 C 5E8
0005D0 18 4 8
0005D2 1A 4 8
0005D4 47 8 0 C 5DC
0005D8 99 00 C 5D8
0005DC 18 4 8
0005DE 1A 4 5
0005E0 99 00 C 5E0
0005E4 99 00 C 5E4
0005E8 99 00 C 5E8

```

```

0005EC 58 4 0 C 1DC
0005F0 5A 4 0 C 1DC
0005F4 59 4 0 C B38
0005F8 47 8 0 C 600
0005FC 99 00 C 5FC
000600 58 4 0 C B44
000604 5A 4 0 C B48
000608 59 4 0 C B38
00060C 47 8 0 C 614
000610 99 00 C 610
000614 58 4 0 C B4C
000618 5A 4 0 C B50
00061C 59 4 0 C B38
000620 47 8 0 C 628
000624 99 00 C 624
000628 58 4 0 C B54
00062C 5A 4 0 C B58

```

```

A1      AR      R4,R8      ADD ZERO PLUS ZERO
        BC      ZERO,A1
        HPR
        A      R4,MINUS1
        CR      R4,R5
        BC      ZERO,A2
        HPR
ERR      LR      R4,R8
        A      R4,ZEROS
        CR      R4,R5
        BC      ZERO,ARERR
        LR      R4,R5
        AR      R4,R8
        CR      R4,R5
        BC      ZERO,PATERR
        LR      R4,R8
        AR      R4,R8
        BC      ZERO,CZERR
        HPR
CZERR    LR      R4,R8
        AR      R4,R5
        HPR
ARERR    HPR
PATERR   HPR
*****
* CHECK DO ADDER CIRCUITRY
*****
A2      L      R4,ZROEGT      CONTINUE CHECKING ERROR PATTERN
        A      R4,ZROEGT      00008888 PLUS 00008888
        C      R4,TOT1
        BC      ZERO,CHECK2
        HPR
CHECK2   L      R4,=X'0000EEEE'
        A      R4,=X'00002222'
        C      R4,TOT1
        BC      ZERO,CHECK3
        HPR
CHECK3   L      R4,=X'0000CCCC'
        A      R4,=X'00004444'
        C      R4,TOT1
        BC      ZERO,CHECK4
        HPR
CHECK4   L      R4,=X'00F0F0F0'
        A      R4,=X'00101001'
*****
* ADD WORKS, ZERO, + ZERO, DON'T
  ADD, D=FFFF, B=ZEROS
  TOTAL EQUAL FFFF

* AR INSTRUCTION WORKS, A DOESN'T
  CHECK IF A INSTRUCTION WORKS

  TOTAL EQUAL FFFF

  SET R4 TO ONES
  ADD, D=ZEROS, B=FFFF
  TOTAL EQUAL FFFF
  BRANCH IF PATTERN ERROR
  DO ZEROS ADD CORRECTLY

  ZEROS ADD, PATTERNS DON'T
  * ZEROS AND ONES BOTH ADD WRONG
  RESET ERROR CONDITIONS

  * ZEROS ADD, PATTERNS DON'T
  * INSTRUCTION A WORKS, AR DOESN'T
  * 0+1 ADDS, 1+0 ADDS WRONG
*****

```

000630	59 4 0 C B5C	C	R4,=X'01010010'	
000634	47 8 0 C 63C	BC	ZERO,CHECK5	
000638	99 00 C 638	HPR		* SUM NOT EQUAL TO 01010010
00063C	58 4 0 C B60	L	R4,=X'0F800080'	
000640	5A 4 0 C B64	A	R4,=X'00800080'	ADD 0F800080 PLUS 00800080
000644	59 4 0 C B68	C	R4,=X'10000100'	
000648	47 8 0 C 650	BC	ZERO,CHECK6	
00064C	99 00 C 64C	HPR		* SUM NOT EQUAL TO 10000100
000650	58 4 0 C B6C	L	R4,=X'0F008000'	
000654	5A 4 0 C B70	A	R4,=X'01008000'	ADD 0F008000 PLUS 01008000
000658	59 4 0 C B00	C	R4,ONE001	
00065C	47 8 0 C 664	BC	ZERO,CHECK7	
000660	99 00 C 660	HPR		* SUM NOT EQUAL TO 10010000
000664	58 4 0 C B74	L	R4,=X'0FF80800'	
000668	5A 4 0 C B78	A	R4,=X'00080800'	ADD 0FF80800 PLUS 00080800
00066C	59 4 0 C B7C	C	R4,=X'10001000'	
000670	47 8 0 C 678	BC	ZERO,CHECK8	
000674	99 00 C 674	HPR		* SUM NOT EQUAL TO 10001000
000678	58 4 0 C B80	L	R4,=X'0FFF8000'	
00067C	5A 4 0 C B3C	A	R4,ZERO8	ADD 0FFF8000 PLUS 00008000
000680	59 4 0 C B84	C	R4,=X'10000000'	
000684	47 8 0 C 68C	BC	ZERO,CHECK9	
000688	99 00 C 688	HPR		* SUM NOT EQUAL TO 10000000
00068C	58 4 0 C B88	L	R4,=X'00F8000F'	
000690	5A 4 0 C B8C	A	R4,=X'00080001'	ADD 00F8000F PLUS 00080001
000694	59 4 0 C B90	C	R4,=X'01000010'	
000698	47 8 0 C 6A0	BC	ZERO,CHCK10	
00069C	99 00 C 69C	HPR		* SUM NOT EQUAL TO 01000010
0006A0	58 4 0 C B94	L	R4,=X'00FF8000'	
0006A4	5A 4 0 C B3C	A	R4,ZERO8	ADD 00FF8000 PLUS 00008000
0006A8	59 4 0 C B98	C	R4,=X'01000000'	
0006AC	47 8 0 C 6B4	BC	ZERO,CHCK11	
0006B0	99 00 C 6B0	HPR		* SUM NOT EQUAL TO 01000000
0006B4	58 4 0 C B9C	L	R4,=X'000F8000'	
0006B8	5A 4 0 C B3C	A	R4,ZERO8	ADD 000F8000 PLUS 00008000
0006BC	59 4 0 C BA0	C	R4,=X'00100000'	
0006C0	47 8 0 C 6C8	BC	ZERO,CHCK12	
0006C4	99 00 C 6C4	HPR		* SUM NOT EQUAL TO 00100000
0006C8	58 4 0 C BA4	L	R4,=X'22222222'	
0006CC	5A 4 0 C BA8	A	R4,=X'6666AAAA'	ADD 22222222 PLUS 6666AAAA
0006D0	59 4 0 C 1E4	C	R4,EIGHTC	
0006D4	47 8 0 C 6DC	BC	ZERO,CHCK13	
0006D8	99 00 C 6D8	HPR		* SUM NOT EQUAL TO 8888CCCC
0006DC	58 4 0 C BAC	L	R4,=X'44440000'	

0006E0	5A 4 0 C B80	A	R4,=X'4444CCCC'	ADD 44440000 PLUS 4444CCCC
0006E4	59 4 0 C 1E4	C	R4,EIGHTC	
0006E8	47 8 0 C 6F0	BC	ZERO,CHCK14	
0006EC	99 00 C 6EC	HPR		* SUM NOT EQUAL TO 8888CCCC
0006F0	58 4 0 C 8B4	L	R4,=X'8888BBBB'	
0006F4	5A 4 0 C 1D8	A	R4,ZERONE	ADD 8888BBBB PLUS 00001111
0006F8	59 4 0 C 1E4	C	R4,EIGHTC	
0006FC	47 8 0 C 704	BC	ZERO,CHCK15	
000700	99 00 C 700	HPR		* SUM NOT EQUAL TO 8888CCCC
000704	58 4 0 C 8B8	L	R4,=X'77770008'	
000708	5A 4 0 C 8BC	A	R4,=X'11110008'	ADD 77770008 PLUS 11110008
00070C	59 4 0 C 8C0	C	R4,=X'88880010'	
000710	47 8 0 C 718	BC	ZERO,CHCK16	
000714	99 00 C 714	HPR		* SUM NOT EQUAL TO 88880010
000718	58 4 0 C 8C4	L	R4,=X'EEEEDDDD'	
00071C	5A 4 0 C 1D8	A	R4,ZERONE	ADD EEEEEDDD PLUS 00001111
000720	59 4 0 C 8C8	C	R4,=X'EEEEEEEE'	
000724	47 8 0 C 72C	BC	ZERO,CHCK17	
000728	99 00 C 728	HPR		* SUM NOT EQUAL TO EEEEEEEE
00072C	58 4 0 C AF8	L	R4,HFONES	
000730	5A 4 0 C 8CC	A	R4,=X'FFFF7FFF'	ADD 00007FFF PLUS FFFF7FFF
000734	59 4 0 C 8D0	C	R4,=X'FFFFFFFF'	
000738	47 8 0 C 740	BC	ZERO,CHCK18	
00073C	99 00 C 73C	HPR		* SUM NOT EQUAL TO FFFFFFFF
000740	58 4 0 C 1E8	L	R4,FZZF	
000744	1A 4 8	AR	R4,R8	ADD FF0000FF PLUS 00000000
000746	59 4 0 C 1E8	C	R4,FZZF	
00074A	47 8 0 C 752	BC	ZERO,CHCK19	
00074E	99 00 C 74E	HPR		* SUM NOT EQUAL TO FF0000FF
000752	58 4 0 C 8D4	L	R4,=X'33336666'	
000756	5A 4 0 C 8D8	A	R4,=X'11112222'	ADD 33336666 PLUS 11112222
00075A	59 4 0 C 8DC	C	R4,=X'44448888'	
00075E	47 8 0 C 766	BC	ZERO,CHCK21	
000762	99 00 C 762	HPR		* SUM NOT EQUAL TO 44448888
000766	58 4 0 C BE0	L	R4,=X'0F019998'	
00076A	5A 4 0 C BE4	A	R4,=X'01008888'	ADD 0F019998 PLUS 01008888
00076E	59 4 0 C BE8	C	R4,=X'10022220'	
000772	47 8 0 C 77A	BC	ZERO,CHCK22	
000776	99 00 C 776	HPR		* SUM NOT EQUAL TO 10022220
00077A	58 4 0 C BEC	L	R4,=X'000880B8'	
00077E	5A 4 0 C 1CC	A	R4,FZEA	ADD 000880B8 PLUS 00008008
000782	59 4 0 C 8F0	C	R4,=X'000C00C0'	
000786	47 8 0 C 78E	BC	ZERO,CHCK23	
00078A	99 00 C 78A	HPR		* SUM NOT EQUAL TO 000C00C0

00078E	58 4 0 C BF4	CHCK23	L	R4,=X'000D80D8'	
000792	5A 4 0 C 1CC		A	R4,FZEA	ADD 000D80D8 PLUS 00008008
000796	59 4 0 C BF8		C	R4,=X'000E00E0'	
00079A	47 8 0 C 7A2		BC	ZERO,CHCK24	
00079E	99 00 C 79E		HPR		* SUM NOT EQUAL TO 000E00E0
0007A2	58 4 0 C BFC	CHCK24	L	R4,=X'000E80E8'	
0007A6	5A 4 0 C 1CC		A	R4,FZEA	ADD 000E80E8 PLUS 00008008
0007AA	59 4 0 C C00		C	R4,=X'000F00F0'	
0007AE	47 8 0 C 7B6		BC	ZERO,CHCK25	
0007B2	99 00 C 782		HPR		* SUM NOT EQUAL TO 000F00F0
0007B6	58 4 0 C C04	CHCK25	L	R4,=X'00078078'	
0007BA	5A 4 0 C 1CC		A	R4,FZEA	ADD 00078078 PLUS 00008008
0007BE	59 4 0 C C08		C	R4,=X'00080080'	
0007C2	47 8 0 C 7CA		BC	ZERO,CHCK26	
0007C6	99 00 C 7C6		HPR		* SUM NOT EQUAL TO 00080080
0007CA	58 4 0 C C0C	CHCK26	L	R4,=X'0B80B800'	
0007CE	5A 4 0 C 1D0		A	R4,SZEA	ADD 0B80B800 PLUS 00800800
0007D2	59 4 0 C C10		C	R4,=X'0C00C000'	
0007D6	47 8 0 C 7DE		BC	ZERO,CHCK27	
0007DA	99 00 C 7DA		HPR		* SUM NOT EQUAL TO 0C00C000
0007DE	58 4 0 C C14	CHCK27	L	R4,=X'0D80D800'	
0007E2	5A 4 0 C 1D0		A	R4,SZEA	ADD 0D80D800 PLUS 0D80D800
0007E6	59 4 0 C C18		C	R4,=X'0E00E000'	
0007EA	47 8 0 C 7F2		BC	ZERO,CHCK28	
0007EE	99 00 C 7EE		HPR		* SUM NOT EQUAL TO 0E00E000
0007F2	58 4 0 C C1C	CHCK28	L	R4,=X'0E80E800'	
0007F6	5A 4 0 C 1D0		A	R4,SZEA	ADD 0E80E800 PLUS 00800800
0007FA	59 4 0 C C20		C	R4,=X'0F00F000'	
0007FE	47 8 0 C 806		BC	ZERO,CHCK29	
000802	99 00 C 802		HPR		* SUM NOT EQUAL TO 0F00F000
000806	58 4 0 C C24	CHCK29	L	R4,=X'07807800'	
00080A	5A 4 0 C 1D0		A	R4,SZEA	ADD 07807800 PLUS 00800800
00080E	59 4 0 C C28		C	R4,=X'08008000'	
000812	47 8 0 C 81A		BC	ZERO,CHCK30	
000816	99 00 C 816		HPR		* SUM NOT EQUAL TO 08008000
00081A	58 4 0 C C2C	CHCK30	L	R4,=X'0F00FF80'	
00081E	5A 4 0 C C30		A	R4,=X'01000080'	
000822	59 4 0 C 800		C	R4,ONE001	
000826	47 8 0 C 82E		BC	ZERO,SUB1	NEXT CHECK SUBTRACT INSTRUCTION
00082A	99 00 C 82A		HPR		
00082E	18 4 8	SUB1	LR	R4,R8	* TEST SUBTRACT INSTRUCTIONS
000830	18 4 5		SR	R4,R5	SUBTRACT MINUS ONE FROM ZERO
000832	59 4 0 C 0D4		C	R4,PLUS1	RESULT RIGHT
000836	47 8 0 C 864		BC	ZERO,SUB2	CONTINUE TESTING SUBTRACT

```

00083A 18 4 8
00083C 58 4 0 C 19C
000840 59 4 0 C 0D4
000844 18 4 8
000846 47 8 0 C 85C
00084A 18 4 8
00084C 47 8 0 C 854
000850 99 00 C 850
000854 18 4 8
000856 18 4 5
000858 99 00 C 858
00085C 18 4 8
00085E 18 4 5
000860 99 00 C 860
000864 18 4 8
000866 58 4 0 C 19C
00086A 47 2 0 C 872
00086E 99 00 C 86E
000872 18 4 8
000874 18 4 8
000876 47 8 0 C 87E
00087A 99 00 C 87A
00087E 18 4 8
000880 58 4 0 C 0D4
000884 47 4 0 C 88C
000888 99 00 C 888
00088C 50 5 0 0 E2C
000890 59 5 0 0 E2C
000894 47 8 0 C 8B0
000898 50 8 0 0 E2C
00089C 59 8 0 0 E2C
0008A0 47 8 0 C 8A8
0008A4 99 00 C 8A4
0008A8 50 5 0 0 E2C
0008AC 99 00 C 8AC
0008B0 50 8 0 0 E2C
0008B4 59 8 0 0 E2C
0008B8 47 8 0 C 8C0
0008BC 99 00 C 8BC
0008C0 18 4 8
0008C2 54 4 0 C 804
0008C6 47 8 0 C 8E6
0008CA 18 4 5
0008CC 54 4 0 C 19C

```

```

LR R4,R8
S R4,MINUS1
C R4,PLUS1
SR R4,R8
BC ZERO,SRNR
LR R4,R8
BC ZERO,NGERR
HPR
NGERR LR R4,R8
SR R4,R5
HPR
SRNR LR R4,R8
SR R4,R5
HPR
SUB2 LR R4,R8
S R4,MINUS1
BC POSIT,SUB3
HPR
SUB3 LR R4,R8
SR R4,R8
BC ZERO,SUB4
HPR
SUB4 LR R4,R8
S R4,PLUS1
BC NEG,ST1
HPR
ST1 R5,EXTRA
C R5,EXTRA
BC ZERO,ST2
ST R8,EXTRA
C R8,EXTRA
BC ZERO,STER1
HPR
STER1 R5,EXTRA
ST R8,EXTRA
HPR
ST2 R8,EXTRA
C R8,EXTRA
BC ZERO,N1
HPR
N1 LR R4,R8
N R4,ZEROS
BC ZERO,N2
LR R4,R5
N R4,MINUS1

```

SUBTRACT ZERO FROM ZERO
SR INSTRUCTION DOESN'T WORK

- SR AND S BOTH DON'T WORK
- RESET ERROR CONDITIONS
- ZEROS SUBTRACT, MINUS ONE WRONG

- RESET ERROR CONDITIONS
- S INSTRUCTION WORKS, SR DOESN'T TEST S INSTRUCTION

- COND CODE OR S INST ERROR

- SUBTRACT ZERO FROM ZERO
NEXT CHECK STORE INSTRUCTION
- MINUS ONE SUBTRACTS! ZERO WRONG
CHECK NEGATIVE CONDITION CODE

- NEXT CHECK STORE INSTRUCTION
- ERROR IN NEGATIVE CONDITION CD
STORE ALL ONES
CHECK STORED INFORMATION
BRANCH IF ALL ONES IN STORAGE
STORE ALL ZEROS
CHECK STORED INFORMATION

- NO CORRECT STORAGE
SET UP ERROR CONDITIONS
- ONLY ZEROS STORE CORRECTLY
STORE ALL ONES
CHECK STORED INFORMATION

- ONLY ONES STORE CORRECTLY
AND TOGETHER ZEROS AND ZEROS
CONTINUE TESTING AND (N)
AND TOGETHER ONES AND ONES

```

0008D0 59 4 0 C 19C
0008D4 47 8 0 C 8DC
0008D8 99 00 C 8D8
0008DC 18 4 8
0008DE 54 4 0 C 8D4
0008E2 99 00 C 8E2
0008E6 18 4 5
0008E8 54 4 0 C 8D4
0008EC 47 8 0 C 8F4
0008F0 99 00 C 8F0
0008F4 18 4 5
0008F6 54 4 0 C 19C
0008FA 47 7 0 C 902
0008FE 99 00 C 8FE
000902 19 4 5
000904 47 8 0 C 90C
000908 99 00 C 908
00090C 18 4 8
00090E 56 4 0 C 8D4
000912 47 8 0 C 932
000916 18 4 5
000918 56 4 0 C 19C
00091C 19 4 5
00091E 07 0 1
000920 47 8 0 C 928
000924 99 00 C 924
000928 18 4 8
00092A 56 4 0 C 8D4
00092E 99 00 C 92E
000932 18 4 5
000934 56 4 0 C 8D4
000938 19 4 5
00093A 47 8 0 C 942
00093E 99 00 C 93E
000942 18 4 8
000944 56 4 0 C 19C
000948 19 4 5
00094A 47 8 0 C 952
00094E 99 00 C 94E
000952 18 4 5
000954 56 4 0 C 19C
000958 59 4 0 C 19C
00095C 47 8 0 C 964
000960 99 00 C 960

```

```

C R4,MINUS1
BC ZERO,NIERR
HPR
NIERR LR R4,R8
N R4,ZEROS
HPR
N2 LR R4,R5
N R4,ZEROS
BC ZERO,N3
HPR
N3 LR R4,R5
N R4,MINUS1
BC NZERO,N4
HPR
N4 CR R4,R5
BC ZERO,O1
HPR
O1 LR R4,R8
O R4,ZEROS
BC ZERO,O2
LR R4,R5
O R4,MINUS1
CR R4,R5
BC O,R1
BC ZERO,O1ERR1
HPR
O1ERR1 LR R4,R8
O R4,ZEROS
HPR
O2 LR R4,R5
O R4,ZEROS
CR R4,R5
BC ZERO,O3
HPR
O3 LR R4,R8
O R4,MINUS1
CR R4,R5
BC ZERO,O4
HPR
O4 LR R4,R5
O R4,MINUS1
C R4,MINUS1
BC ZERO,LA1
HPR

```

CHECK RESULT

- INSTRUCTION NOT WORKING
- SET UP ERROR CONDITION
- ONLY ZEROS DON'T AND CORRECTLY SET R4 TO ONES AND TOGETHER ZEROS AND ONES CONTINUE TEST
- ZEROS AND ONES NOT CORRECT AND TOGETHER ONES PLUS ONES
- ONES PLUS ONES NOT CORRECT
- ONES PLUS ONES NOT CORRECT BEGIN TESTING OR INSTRUCTION
- BRANCH IF CORRECT RESULT
- RESULT SHOULD EQUAL ALL ONES
- ONLY ZEROS DON'T OR CORRECTLY SET UP ERROR CONDITIONS OR TOGETHER ZEROS PLUS ZEROS
- INCORRECT RESULT (ZEROS OR ONE) SET R4 TO ONES OR TOGETHER ZEROS PLUS ONES
- INCORRECT RESULT (ONES OR ZERO) SET R4 TO ZEROS
- RESULT EQUAL TO ALL ONES
- INSTRUCTION DOESN'T WORK OR TOGETHER ONES PLUS ONES
- ONES OR ONES GIVE WRONG RESULT

```

000964 41 4 0 0 FFF
000968 59 4 0 C 104
00096C 47 8 0 C 994
000970 48 4 0 C 19C
000974 59 4 0 C 0E4
000978 47 8 0 C 980
00097C 99 00 C 97C
000980 41 4 0 0 000
000984 59 4 0 C 804
000988 47 8 0 C 990
00098C 99 00 C 98C
000990 99 00 C 990
000994 41 4 0 9 000
000998 19 4 9
00099A 47 8 0 C 9A2
00099E 99 00 C 99E

```

```

0009A2 58 D 0 C B04
0009A6 58 A 0 0 038
0009AA 54 A 0 C 034
0009AE 47 7 0 C 9CA
0009B2 58 E 0 0 038
0009B6 54 E 0 C AFD
0009BA 41 E 0 E 100
0009BE 58 F 0 0 038
0009C2 54 F 0 C 024
0009C6 47 F 0 C A0A
0009CA 58 E 0 C B04
0009CE 58 A 0 0 058
0009D2 54 A 0 C 034
0009D6 47 7 0 C 9EE
0009DA 41 D 0 0 1A0
0009DE 58 F 0 0 058
0009E2 54 F 0 C 024
0009E6 41 F 0 F 100
0009EA 47 F 0 C A0A
0009EE 58 A 0 0 068
0009F2 54 A 0 C 034
0009F6 47 7 0 C AD4
0009FA 41 D 0 0 1A8
0009FE 58 F 0 0 068
000A02 54 F 0 C 024

```

```

LA1      LA      R4,4095
          C      R4,0FFF
          BC     ZERO,LA2
          LH     R4,MINUS1
          C      R4,SXONES
          BC     ZERO,LAERR
          HPR
LAERR     LA      R4,0000
          C      R4,ZEROS
          BC     ZERO,LAERR2
          HPR
LAERR2    HPR
LA2       LA      R4,0000(D,R9)
          CR     R4,R9
          BC     ZERO,SIOCHK
          HPR
*****
* DETERMINE INITIAL LOAD CHANNEL AND BEGIN SIO CHECK
*****
SIOCHK    L      R13,ZEROS
          L      R10,OMSPSW
          N      R10,FF00
          BC     NONZ,SELTOR
          L      R14,OMSPSW
          N      R14,SCWMSK
          LA     R14,256(,R14)
          L      R15,OMSPSW
          N      R15,FF
          BC     UNCOND,RESRVE
          L      R14,ZEROS
          L      R10,OS1PSW
          N      R10,FF00
          BC     NONZ,SELTRZ
          LA     R13,416
          L      R15,OS1PSW
          N      R15,FF
          LA     R15,256(,R15)
          BC     UNCOND,RESRVE
          L      R10,OS2PSW
          N      R10,FF00
          BC     NONZ,ILLEGL
          LA     R13,424
          L      R15,OS2PSW
          N      R15,FF

```

```

BEGIN TESTING LA INSTRUCTION
CONSTANT SHOULD BE LOADED
CONTINUE TESTING IF OK
ISOLATE FAULT
CHECK IF LH WORKS

```

```

* NEITHER LA NOR LH WORKS
CHECK IF ZEROS LOAD CORRECTLY

```

```
CONTINUE ISOLATION
```

```

* NEITHER ONES NOR ZEROS LOAD
* ZEROS LOAD OK ONES DON'T
TOTAL EQUAL CONTENTS OF R9?
SHOULD BE EQUAL
COMPARE HALF INSTRUCTION WORKS
* ADD MODIFICATION ERROR

```

```

CLEAR SUPERVIZOR REGISTER 13
CHECK FOR INITIAL LOAD CHANNEL
WAS INIAL LOAD FROM MPX?
IF CC NOT ZERO, LOAD FROM SELTR
LOAD OLD MPX SHARED PSW
OBTAIN SCW ADDRESS
R14 EQUALS ADDRESS OF MPX CSW
OBTAIN CHAN AND DEVICE NUMBER
R15 EQUALS CHANNEL AND DEVICE #
SAVE DEVICE AND CHAN AND SCW
CLEAR SUPERVISOR REGISTER 14
WAS INITIAL LOAD FROM SEL #1?

```

```

IF CC ZERO, LOAD FROM SEL #1
R13 EQUALS ADDRESS OF CSW
OBTAIN CHANNEL AND DEVICE #
R15 EQUALS DEVICE#
R15 EQUALS CHANNEL AND DEVICE #
SAVE CHANNEL AND DEVICE AND CSW
WAS INTIAL LOAD FROM SEL #2

```

```

IF CC ZERO, LOAD FROM SEL #2
R13 EQUALS ADDRESS OF CSW
OBTAIN CHANNEL AND DEVICE #
R15 EQUALS DEVICE #

```

000A06	41 F 0 F 200	RESRVE	LA	R15,512(,R15)	R15 EQUALS CHANNEL AND DEVICE#
000A0A	50 D 0 0 E20		ST	R13,LODR13	ADDR OF CSW (MPX = 0)
000A0E	50 E 0 0 E24		ST	R14,LODR14	ADDR OF SCW (SEL = 0)
000A12	50 F 0 0 E28		ST	R15,LODR15	CHANNEL AND DEVICE NUMBER
000A16	58 1 0 C 044		L	R1,XQTS10	GET START I/O INSTRUCTION
000A1A	50 1 0 0 F00		ST	R1,3840	STORE AT HEX ADR=0F00
000A1E	58 1 0 C 054		L	R1,JMPF04	GET WAIT INSTRUCTION
000A22	50 1 0 0 F04		ST	R1,3844	STORE IT AT HEX ADR = 0F04
000A26	12 8 8		LTR	R8,R8	ARE MARS TO BE LOADED?
000A28	47 7 0 C 354		BC	NONZ,MARLOD	CHECK START I/O, IF R8 IS 0
000A2C	07000700		DC	3X'07000700'	ALIGN WITH DISC PRELUDE
	07000700				
	07000700				
000A38	9C 00 0 3FF		SIO	1023(0)	SIO TO CHANNEL 3 (NON-EXISTENT)
000A3C	47 1 0 C A44		BC	1,MPXSEL	CC SHOULD = 3, NOT OPERATIONAL
000A40	99 00 C A40		HPR		• CC NOT 3 OR SIO MALFUNCTION
000A44	12 A E	MPXSEL	LTR	R10,R14	CHECK FOR MPX OR SEL
000A46	47 8 0 C A7C		BC	ZERO,CHKSEL	IF R14 EQUALS ZERO, SELECTOR CH
000A4A	41 A 0 C AD8		LA	R10,ILLINT	LOAD R10 WITH ADDR FOR MPX INT
000A4E	50 A 0 0 0BC		ST	R10,NHSPSW+4	STORE IN NEW MPX SHARED PSW
000A52	41 A 0 C AFC		LA	R10,MUXBCW	MPX SCW TO R10
000A56	50 A 0 E 000		ST	R10,0(,R14)	STORE AT PROPER ADDRESS
000A5A	41 0 0 0 003		LA	RO,3	LOAD CAW (RO) WITH NO-OP
000A5E	9C 00 F 000		SIO	0(R15)	SEND NO-OP, IMMEDIATE CONTROL
000A62	47 4 0 C A6A		BC	4,SUTATS	COMMAND, CONTROL UNIT RETURNS
000A66	99 00 C A66		HPR		• CHANNEL AND DEVICE END, CC = 1
000A6A	41 A 0 0 003	SUTATS	LA	R10,3	LOAD R10 WITH NO-OP COMMAND
000A6E	56 A 0 C 11C		O	R10,STATUS	ADD DEVICE AND CHANNEL END
000A72	19 0 A		CR	RO,R10	CHECK CAW FOR DEVICE AND CHAN-
000A74	47 8 0 C C54		BC	EQL,MEMORY	NEL END, CC SHOULD EQUAL 0
000A78	99 00 C A78		HPR		• DEVICE OR CHAN END NOT STORED
000A7C	41 A 0 C ADC	CHKSEL	LA	R10,SELINT	LOAD R10 WITH ADDR FOR SEL INT
000A80	50 A 0 0 0DC		ST	R10,NS1PSW+4	STORE IN NEW SELECTOR CHANNEL
000A84	50 A 0 0 0EC		ST	R10,NS2PSW+4	ONE AND TWO PSW ADDRESS
000A88	50 A 0 D 000		ST	R10,0(,R13)	STORE IN SELECTOR CHANNEL
000A8C	58 A 0 C 19C		L	R10,MINUS1	ALL F'S TO R10
000A90	50 A 0 D 004		ST	R10,4(,R13)	STATUS WORD
000A94	41 0 0 C AEO		LA	RO,SLXCCW	LOAD RO WITH SELECTOR CHANNEL
000A98	9C 00 F 000		SIO	0(R15)	CCW ADDRESS, SEND NO-OP TO C.U.
000A9C	47 4 0 C AA4		BC	4,SELSTA	CHECK FOR NORMAL COMPLETION
000AAD	99 00 C AAD		HPR		• CC NOT EQUAL TO 1
000AA4	41 A 0 C AEO	SELSTA	LA	R10,SLXCCW	LOAD R10 WITH CAW
000AA8	56 A 0 C 11C		O	R10,STATUS	OR IN CHANNEL AND DEVICE END
000AAC	19 0 A		CR	RO,R10	WAS A DEVICE END AND A CHANNEL

```

000AAE 47 8 0 C AB6
000AB2 99 00 C AB2
000AB6 58 A 0 D 000
000ABA 54 A 0 C 118
000ABE 59 A 0 C AF4
000AC2 47 8 0 C C54
000AC6 48 1 0 C 000
000ACA 54 1 0 C C34
000ACE 16 1 0
000AD0 99 00 1 000
000AD4 99 00 C AD4
000AD8 99 00 C AD8
000ADC 99 00 C ADC
000AED 03000E10
000AE4 00000001
000AE8 FF000E10
000AEC 00000001
000AF0 00000070
000AF4 03000000
000AF8 0000
000AFA 7FFF
000AFC 0010
000AFE 0E10
000B00 10010000
000B04 00000000
000B08 00000004
000B0C 00000000
000B10 00000000
000B18 00000001
000B1C 38000000 30
000B21 00037C
000B24 0002
000B26 0B28
000B28 00C0
000B2A 0B2C
000B2C 0D25
000B2E C5D5C440 C4D4D94D
000B36 0D25
000B38 00011110
000B3C 00008000
000B40 0000FFFF
000B44 0000EEEE

```

```

CHKCSW BC
HPR
L R10,0(,R13)
N R10,STSand
C R10,CSWCHD
BC EQL,MEMORY
LH R1,0(0,R12)
N R1,FOCON
OR R1,R0
HPR 0(R1)
ILLEGL HPR
ILLINT HPR
SELINT HPR
SLXCCW DC
DC
DC
DC
DC
SCWMSK DC
CSWCHD DC
HFONES DC
HFONEA DC
MUXBCW DC
DC
ONED01 DC
ZEROS DC
FOUR DC
DC
TRACK0 DC
DC
MSGDMR DC
DC
DC
DC
DC
ENDBCW DC
DC
ENDMSG DC
DC
DC
DC
TOT1 DC
ZEROS DC
LDFFFF DC
LTORG
EQL,CHKCSW
R10,0(,R13)
R10,STSand
R10,CSWCHD
EQL,MEMORY
R1,0(0,R12)
R1,FOCON
R1,R0
0(R1)
X'03000E10'
F'1'
X'FF000E10'
F'1'
X'00000070'
X'03000000'
X'0000'
X'7FFF'
X'0010'
Y(MXBCW1)
X'10010000'
X'00000000'
X'00000004'
F'00'
2F'0'
X'00000001'
X'3800000030'
AL3(L0DMAR)
X'0002'
Y(ENDBCW)
X'00C0'
Y(ENDMSG)
X'0D25'
C'END DMR
X'0D25'
X'00011110'
X'00008000'
X'0000FFFF'

```

```

END RECEIVED FROM THE C.U.?
DEVICE OR CHAN END MISSING
CSW COMMAND CODE AND ADDRESS
COMMAND CODE IN R10
CHECK FOR NO-OP COMMAND
IF COMMAND CODE CORRECT CHECK
PICKUP STATUS FROM TOP OF CAW
AND-OUT SIGN EXTENSION, ETC.
OR-IN COMMAND CODE FROM CAW
• DISPLAY STATUS/CHD (STA BAD)
• ILLEGAL CHANNEL
• MPX INTERRUPT DURING NO-OP
• SEL INTERRUPT DURING NO-OP

```

SEEK BUFFER / CYL 00 TR 00

WRITE COMMAND

PATTERNS FOR ADDER TEST

LOADER CONSTANT/SPACE FILL

000B48	00002222
000B4C	0000CCCC
000B50	00004444
000B54	00F0F00F
000B58	00101001
000B5C	01010010
000B60	0F800080
000B64	00800080
000B68	10000100
000B6C	0F008000
000B70	01008000
000B74	0FF80800
000B78	00080800
000B7C	10001000
000B80	0FFF8000
000B84	10000000
000B88	00F8000F
000B8C	00080001
000B90	01000010
000B94	00FF8000
000B98	01000000
000B9C	000F8000
000BA0	00100000
000BA4	22222222
000BA8	6666AAAA
000BAC	44440000
000BB0	4444CCCC
000BB4	88888888
000BB8	77770008
000BBC	11110008
000BC0	88880010
000BC4	EEEEDDDD
000BC8	EEEEEEEE
000BCC	FFFF7FFF
000BD0	FFFFFFFFE
000BD4	33336666
000BD8	11112222
000BDC	44448888
000BE0	0F019998
000BE4	01008888
000BE8	10022220
000BEC	00088088
000BF0	000C00C0
000BF4	000D80D8

```

000BF8 000E00E0
000BFC 000E80E8
000C00 000F00F0
000C04 00078078
000C08 00080080
000C0C 0880B800
000C10 0C00C000
000C14 0D80D800
000C18 0E00E000
000C1C 0E80E800
000C20 0F00F000
000C24 07807800
000C28 08008000
000C2C 0F00FF80
000C30 01000080
000C34 000000F0
000C38 F0F0F0F0
000C3C 0F0F0F0F
000C40 FFFFFFFF
000C44 00000000
000C48 00001000
000C4C 00005000
000C50 00000004
000C54 58 1 0 C C48
000C58 58 2 0 C C4C
000C5C 58 3 0 C C38
000C60 58 4 0 C C3C
000C64 58 5 0 C C40
000C68 58 6 0 C C44
000C6C 58 3 0 1 000
000C70 58 7 0 1 000
000C74 19 3 7
000C76 47 8 0 C C7E
000C7A 99 00 7 000
000C7E 50 4 0 1 000
000C82 58 8 0 1 000
000C86 19 4 8
000C88 47 8 0 C C90
000C8C 99 00 8 000
000C90 50 5 0 1 000
000C94 58 9 0 1 000
000C98 19 5 9
000C9A 47 8 0 C CA2
000C9E 99 00 9 000

```

```

FUCON      DC      X'000000F0'
FOS         DC      X'F0F0F0F0'
OFS         DC      X'0F0F0F0F'
FFS         DC      X'FFFFFFF'
OOS         DC      X'00000000'
BGN         DC      X'00001000'
FIN         DC      X'00005000'
ONEFW      DC      X'00000004'
MEMORY      L      R1,BGN
            L      R2,FIN
            L      R3,FOS
            L      R4,OFS
            L      R5,FFS
            L      R6,OOS
M1          ST     R3,0(,R1)
            L      R7,0(,R1)
            CR     R3,R7
            BC     8,M2
            HPR    0(R7)
M2          ST     R4,0(,R1)
            L      R8,0(,R1)
            CR     R4,R8
            BC     8,M3
            HPR    0(R8)
M3          ST     R5,0(,R1)
            L      R9,0(,R1)
            CR     R5,R9
            BC     8,M4
            HPR    0(R9)

```

```

* * * * *
*                               *
*   S T O R A G E   T E S T   *
*   C O N S T A N T S         *
* * * * *
CHECK ADDRESSES 01000-05000
      R1 = START / CURRENT...f
      R2 = ENDING ADDRESS
      R3 = R6 ARE PATTERNS...2
      R7 = R10 CHECK READ...2

```

* F0F0F0F0 DIDNT WRITE / READ

* 0F0F0F0F DIDNT WRITE / READ

* FFFFFFFF DIDNT WRITE / READ

000CA2 50 6 0 1 000
 000CA6 58 A 0 1 000
 000CAA 19 6 A
 000CAC 47 8 0 C CB4
 000CB0 99 00 A 000
 000CB4 5A 1 0 C C50
 000CB8 19 1 2
 000CBA 47 C 0 C C6C
 000CBE 47 F 0 C 204

M4

M5

ST R6,0(,R1)
 L R10,0(,R1)
 CR R4,R10
 BC 8,M5
 HPR 0(R10)
 A R1,ONEFW
 CR R1,R2
 BC 12,M1
 BC 15,SCAN
 END

• 00000000 DIDNT WRITE / READ

	\$DMRDOP	START USING	0 *,12
000001	B1	EQU	1
000002	B2	EQU	2
000003	B3	EQU	3
000004	B4	EQU	4
000005	B5	EQU	5
000006	B6	EQU	6
000007	B7	EQU	7
000008	B8	EQU	8
000009	B9	EQU	9
00000A	B10	EQU	10
00000B	B11	EQU	11
00000C	B12	EQU	12
00000D	B13	EQU	13
00000E	B14	EQU	14
00000F	B15	EQU	15
000000	R0	EQU	0
000001	R1	EQU	1
000002	R2	EQU	2
000003	R3	EQU	3
000004	R4	EQU	4
000005	R5	EQU	5
000006	R6	EQU	6
000007	R7	EQU	7
000008	R8	EQU	8
000009	R9	EQU	9
00000A	R10	EQU	10
00000B	R11	EQU	11
00000C	R12	EQU	12
00000D	R13	EQU	13
00000E	R14	EQU	14
00000F	R15	EQU	15
000000	S0ABS	EQU	0
000010	S1ABS	EQU	16
000020	S2ABS	EQU	32
000030	S3ABS	EQU	48
000040	S4ABS	EQU	64
000050	S5ABS	EQU	80
000060	S6ABS	EQU	96
000070	S7ABS	EQU	112
000080	S8ABS	EQU	128
000090	S9ABS	EQU	144

0000A0	S10ABS	EQU	160
0000B0	S11ABS	EQU	176
0000C0	S12ABS	EQU	192
0000D0	S13ABS	EQU	208
0000E0	S14ABS	EQU	224
0000F0	S15ABS	EQU	240
* * * * *			
000008	OSVPSW	EQU	X'008'
000018	OPRPSW	EQU	X'018'
000028	OTMPSW	EQU	X'028'
000038	OMSPSW	EQU	X'038'
000048	OMNPSW	EQU	X'048'
000058	OS1PSW	EQU	X'058'
000068	OS2PSW	EQU	X'068'
000078	ONUPSW	EQU	X'078'
000088	NSVPSW	EQU	X'088'
000098	NPRPSW	EQU	X'098'
0000A8	NTMPSW	EQU	X'0A8'
0000B8	NMSPSW	EQU	X'0B8'
0000C8	NMNPSW	EQU	X'0C8'
0000D8	NS1PSW	EQU	X'0D8'
0000E8	NS2PSW	EQU	X'0E8'
000114	IPLBCW	EQU	X'114'
000190	TCW	EQU	X'190'
0001A0	CSW1	EQU	X'1A0'
0001A8	CSW2	EQU	X'1A8'
* * * * *			
000008	ZERO	EQU	8
000007	NONZ	EQU	7
000004	LSZ	EQU	4
00000C	LEZ	EQU	12
000002	GTZ	EQU	2
00000A	GEZ	EQU	10
000008	EQL	EQU	8
000007	NEQ	EQU	7
00000F	UNCOND	EQU	15
000004	MIXED	EQU	4
000001	ONES	EQU	1
00000E	NONES	EQU	14
000002	POSIT	EQU	2
000004	NEG	EQU	4
000007	NZERO	EQU	7
000E10	MXBCWI	EQU	3600
000E20	LDR13	EQU	3616

CC FOR NON-ZERO
 CC FOR NEGATIVE
 CC FOR POSITIVE
 TEMP STORAGE
 TEMP STORAGE

	000E24	LODR14	EQU	3620	TEMP STORAGE
	000E28	LODR15	EQU	3624	TEMP STORAGE
	000E2C	EXTRA	EQU	3628	TEMP STORAGE
		•			
000000	99 00 0 000		HPR	0(0)	* PRELUDE ERROR STOP, SUPV REG 0
000004	00000000		DC	X'00000000'	PROBLEM REGISTER 0
000008	00000000 00000000		DC	XL8'00000000'	OLD SUPERVISOR PSW
000010	00000444		DC	A(CCNOTO)	SUPERVISOR REGISTER 1
000014	00000000		DC	X'00000000'	PROBLEM REGISTER 1
000018	00000000 00000000		DC	XL8'00000000'	OLD PROGRAM PSW
000020	0000045C		DC	A(BRANCH)	SUPERVISOR REGISTER 2
000024	000000FF	FF	DC	X'000000FF'	
000028	00000000 00000000		DC	XL8'00000000'	OLD TIMER PSW
000030	00000450		DC	A(CCODE1)	SUPERVISOR REGISTER 3
000034	0000FF00	FF00	DC	X'0000FF00'	
000038	0000FFFF		DC	2X'0000FFFF'	OLD MPX SHARED PSW
	0000FFFF				
000040	00000000		DC	X'00000000'	SUPERVISOR REGISTER 4
000044	9C00F000	XQTS10	DC	X'9C00F000'	START I/O INSTRUCTION
000048	00000000 00000000		DC	XL8'00000000'	OLD MPX NON-SHARED PSW
000050	FFFFFFFF		DC	X'FFFFFFFF'	SUPERVISOR REGISTER 5
000054	47F00F04	JMPF04	DC	X'47F00F04'	WAIT AT F04 FOR INTERRUPT
000058	0000FFFF		DC	2X'0000FFFF'	OLD SELECTOR CHAN #1 PSW
	0000FFFF				
000060	00000458		DC	A(LINK)	SUPERVISOR REGISTER 6
000064	00000000		DC	X'00000000'	PROBLEM REGISTER 6
000068	0000FFFF		DC	2X'0000FFFF'	OLD SELECTOR CHAN #2 PSW
	0000FFFF				
000070	0000044C		DC	A(CCODE2)	SUPERVISOR REGISTER 7
000074	00000000		DC	X'00000000'	PROBLEM REGISTER 7
000078	00000000 00000000		DC	XL8'00000000'	UNUSED OLD PSW LOCATION
000080	00000000		DC	X'00000000'	SUPERVISOR REGISTER 8
000084	00000000		DC	X'00000000'	PROBLEM REGISTER 8
000088	00000000		DC	X'00000000'	NEW SUPERVISOR PSW
00008C	0000042A		DC	A(PRESVC)	ERROR-LOOP ADDRESS FOR PRELUDE
000090	00000004		DC	X'00000004'	SUPERVISOR REGISTER 9
000094	00000000		DC	X'00000000'	PROBLEM REGISTER 9
000098	00000000		DC	X'00000000'	NEW PROGRAM PSW
00009C	000001F0		DC	A(HPR98)	ERROR STOP ADDRESS FOR PRELUDE
0000A0	10000000		DC	X'10000000'	SUPERVISOR REGISTER 10
0000A4	00000000		DC	X'00000000'	PROBLEM REGISTER 10
0000A8	00000000		DC	X'00000000'	NEW TIMER PSW
0000AC	000001F4		DC	A(HPRA8)	ERROR STOP ADDRESS FOR PRELUDE
0000B0	20000000		DC	X'20000000'	SUPERVISOR REGISTER 11

000084	00000000		DC	X'00000000'	PROBLEM REGISTER 11
000088	08000000		DC	X'08000000'	NEW MPX=SHARED PSW
00008C	30		DC	X'30'	SET CC TO 3 ON INTERRUPT
00008D	000400		DC	AL3(PREDMR)	PRELUDE STARTING ADDRESS
0000C0	00000000		DC	X'00000000'	SUPERVISOR REGISTER 12
0000C4	00000000		DC	X'00000000'	PROBLEM REGISTER 12
0000C8	00000000		DC	X'00000000'	NEW MPX NON=SHARED PSW
0000CC	000001F8		DC	A(HPRC8)	ERROR STOP ADDRESS FOR PRELUDE
0000D0	00000408		DC	A(PREBCX)	SUPERVISOR REGISTER 13
0000D4	00000001	PLUS1	DC	X'00000001'	
0000D8	20000000		DC	X'20000000'	NEW SELECTOR CHANNEL 1 PSW
0000DC	30		DC	X'30'	SET CC TO 3 ON INTERRUPT
0000DD	000400		DC	AL3(PREDMR)	PRELUDE STARTING ADDRESS
0000E0	30000000		DC	X'30000000'	SUPERVISOR REGISTER 14
0000E4	0000FFFF	SXONES	DC	X'0000FFFF'	
0000E8	10000000		DC	X'10000000'	NEW SELECTOR CHANNEL 2 PSW
0000EC	30		DC	X'30'	SET CC TO 3 ON INTERRUPT
0000ED	000400		DC	AL3(PREDMR)	PRELUDE STARTING ADDRESS
0000F0	0000048C		DC	A(LTRCC1)	SUPERVISOR REGISTER 15
0000F4	00000000		DC	X'00000000'	PROBLEM REGISTER 15
0000F8	00000000		DC	X'00000000'	UNUSED NEW PSW LOCATION
0000FC	000001FC		DC	A(HPRF8)	ERROR STOP ADDRESS FOR PRELUDE
000100	00800000		DC	X'00800000'	CONSOLE SHARED SCW
000104	00000000		DC	3X'00000000'	HARDWARE STORAGE LOCATIONS
	00000000				
	00000000				
000110	00000114		DC	X'00000114'	MPX SHARED SCW #1
000114	EEA00118		DC	X'EEA00118'	INITIAL LOAD BCW
000118	FF000000	STSAND	DC	X'FF000000'	CONSTANT TO GET STATUS CODES
00011C	00000010	NEXTBL	DC	F'16'	FOUR-WORD INCREMENT
000120	00000114		DC	X'00000114'	MPX SHARED SCW #2
000124	0C000000	STATUS	DC	X'0C000000'	EXPECTED STATUS/SIO
000128	38000000	ANYPSW	DC	X'38000000'	
00012C	30000000		DC	X'30000000'	
000130	00000114		DC	X'00000114'	MPX SHARED SCW #3
000134	00000001	ENTRY1	DC	X'00000001'	DHRS START AT CYL 00, TRACK 01
000138	00000005		DC	X'00000005'	NUMBER OF 3600 BYTE BLOCKS
00013C	00001000		DC	X'00001000'	DHR... LOAD ADDRESS
000140	00000114		DC	X'00000114'	MPX SHARED SCW #4
000144	00000006	ENTRY2	DC	X'00000006'	FIRST OPTION AT CYL 00, TRK 06
000148	00000001		DC	X'00000001'	NUMBER OF 3600 BYTE BLOCKS
00014C	00005000		DC	X'00005000'	LOAD ADR...ENTRY 2
000150	00000114		DC	X'00000114'	MPX SHARED SCW #5
000154	00000007	ENTRY3	DC	X'00000007'	SECOND OPTION AT CYL 00, TRK 07

```

*
*****
*
*          LOADER ERROR STOP
*
*****
*

```

0001B4	99 00 4 000	STSERR	HPR	0(R4)	• STATUS ERROR IN CSW
0001B8	47 F 0 C 1B8		BC	15,•	
0001BC	99 00 4 000	CMDERR	HPR	0(R4)	• CMD STORED WRONG IN CSW
0001C0	47 F 0 C 1C0		BC	15,•	
0001C4	99 00 4 000	CCWERR	HPR	0(R4)	• CCW ADR WRONG IN CSW
0001C8	47 F 0 C 1C8		BC	15,•	

```

0001CC      00008008      FZEA      DC      X'00008008'
0001DD      00800800      SZEA      DC      X'00800800'
0001D4      00000FFF      OFFF      DC      X'00000FFF'      PATTERN FOR LOAD ADDRESS TEST
0001D8      00001111      ZERONE   DC      X'00001111'
0001DC      00008888      ZROEGT  DC      X'00008888'
0001E0      00020000      TWOK    DC      X'00020000'      CYLINDER 02, TRACK 00
0001E4      8888CCCC      EIGHTC  DC      X'8888CCCC'
0001E8      FF0000FF      FZZF    DC      X'FF0000FF'

```

0001EC	99 00	0 08A	HPR88	HPR	136(0)	* SUPERVISOR PSW SWAP ERROR
0001F0	99 00	0 094	HPR98	HPR	152(0)	* PROGRAM PSW SWAP ERROR
0001F4	99 00	0 0AB	HPRA8	HPR	168(0)	* TIMER PSW SWAP ERROR

0001F8 99 00 0 0C8
 0001FC 99 00 0 0F8
 000200

000200 45 8 0 C 9A2
 000204 41 1 0 C 388
 000208 41 2 0 C 218
 00020C 47 F 0 C 34C
 000210 00010000
 000214 47 F 0 0 268
 000218 41 1 0 C 388
 00021C 58 2 0 C 124
 000220 41 6 0 C 228
 000224 47 F 0 C 2F6
 000228 41 1 0 C 398
 00022C 41 2 0 C 234
 000230 47 F 0 C 34C
 000234 41 1 0 C 3A0
 000238 58 2 0 C 124
 00023C 41 6 0 C 244
 000240 47 F 0 C 2F6
 000244 41 1 0 C 380
 000248 41 2 0 C 250
 00024C 47 F 0 C 34C
 000250 41 1 0 C 3A0
 000254 58 2 0 C 124
 000258 41 6 0 C 268
 00025C 47 F 0 C 2F6
 000260 58 1 0 C 210
 000264 47 F 0 C 338

000268 1B C C
 00026A 58 D 0 0 E20
 00026E 58 E 0 0 E24
 000272 58 F 0 0 E28
 000276 58 1 0 C 18C
 00027A 59 1 0 C 184
 00027E 47 A 0 C 3E8
 000282 58 2 0 1 000
 000286 50 2 0 C 378

```

HPRC8      HPR      200(0)      * MPX NON-SHARED PSW SWAP ERROR
HPRF8      HPR      248(0)      * UNUSED PSW SWAP ERROR
          ORG      $DMRDOP+512      SET ADDRESS TO HEX 200
*****
*      PRE-LOAD CHECKOUT CMD/CHAIN/TIC
*****
          BAL      R8,SIOCHK      LOAD MARS IMMEDIATELY
SCAN      LA      R1,CHAINX      RECALIBRATE CMD : IMMEDIATE !!
          LA      R2,SIOX2B      RETURN ADDRESS,
          BC      15,DISCXX      INITIATE I/O (R15)
IDS      DC      F'65536'      IDENTIFIER BLOCK ADDRESS
SCAN0     BC      15,DSCAN(,0)   BRANCH TO TABLE SCAN
SIOX2B     LA      R1,CHAINX      LAST CCW SENT (ADDRESS)
          L      R2,STATUS      XPTD STA
          LA      R6,SIOX3A      RET ADR
          BC      15,COMPAR      CK CMD/NXT CCW/STA
SIOX3A     LA      R1,CHAINY      SEEK CMD, CHAIN TO RECALIBRATE
          LA      R2,SIOX3B      RETURN ADDRESS
          BC      15,DISCXX      INITIATE I/O
SIOX3B     LA      R1,CHAINY+8    RECALIBRATE CCW ADDRESS
          L      R2,STATUS      XPTD STA
          LA      R6,SIOX4A      RET ADR
          BC      15,COMPAR      CK CMD/NXT CCW/STA
SIOX4A     LA      R1,TICX01     SEEK CMD, TIC TO RECALIBRATE
          LA      R2,SIOX4B      RETURN ADDRESS
          BC      15,DISCXX      INITIATE I/O
SIOX4B     LA      R1,CHAINY+8    SEEK CMD ADDRESS
          L      R2,STATUS      XPTD STA
          LA      R6,DSCAN      RET ADR
          BC      15,COMPAR      CK CMD/NXT CCW/STA
          L      R1,IDS          GET LOAD ADDRESS FOR ID-BLOCK
          BC      15,LODMAR+4    LOAD IDENTIFIER PATTERN
*****
*      LOADER SCHEDULING ROUTINE
*****
DSCAN     SR      R12,R12      LOADER INITIAL SETUPICLR BASE
          L      R13,LODR13(,0)  GET CSW ADR
          L      R14,LODR14(,0)  GET SCW ADR
          L      R15,LODR15(,0)  GET CHN/DEV
          L      R1,BASEXP      TABLE POINTER FOR LOADER USE
          C      R1,ENTRY6      END-OF-TABLE = DONE,GET MARS
          BC      10,MARLOD      BRANCH IF DONE.
DSCAN1    L      R2,0(,R1)      GET TABLE ENTRY : FIRST WORD
          ST      R2,SRHADR      SAVE FOR SEARCH CCW

```


00028A	18 2 2	SR	R2,R2	CLEAR R2
00028C	18 6 2	LR	R6,R2	CLEAR R6
00028E	58 8 0 1 004	L	R8,4(,R1)	GET TABLE ENTRY : 2ND = #BLOCK
000292	58 9 0 1 008	L	R9,8(,R1)	GET TABLE ENTRY : 3RD = ADR
000296	18 5 9	LR	R5,R9	SAVE LOAD-ADDRESS FOR LATER
000298	18 7 9	LR	R7,R9	SAVE LOAD-ADDRESS FOR LATER
00029A	5A 1 0 C 11C	A	R1,NEXTBL	INCREMENT TABLE POINTER.
00029E	50 1 0 C 18C	ST	R1,BASEXP	SAVE NEW POINTER VALUE.
0002A2	41 1 0 C 3CD	LA	R1,LODCAL	SEEK/SEARCH/TIC/READ CCW ADR
0002A6	58 A 0 C 3ED	L	R10,READ	GET READ CCW
0002AA	54 A 0 C 180	N	R10,FFFFF22	AND-OUT OLD ADDRESS
0002AE	16 A 9	OR	R10,R9	OR-IN NEW ADDRESS
0002B0	50 A 0 C 3EO	ST	R10,READ	SAVE READ CCW
0002B4	41 2 0 C 28C	LA	R2,LOADCK	RETURN ADDRESS
0002B8	47 F 0 C 34C	BC	15,DISCXX	INITIATE I/O
0002BC	41 1 0 C 3EO	LA	R1,READ	LAST CCW ADR
0002C0	58 2 0 C 124	L	R2,STATUS	XPTD STA
0002C4	41 6 0 C 2CC	LA	R6,LOADOK	RET ADR
0002C8	47 F 0 C 2F6	BC	15,COMPAR	CK CMD/NXT CCW/STA
0002CC	58 1 0 C 194	L	R1,MARIDS	GET MAR-ID CODE
0002D0	59 1 0 9 000	C	R1,0(,R9)	TEST FOR ID LOADED
0002D4	47 8 0 C 3E8	BC	EQL,MARLOD	BRANCH IF ID IS IN
0002D8	5A 9 0 C 198	A	R9,RECORD	INCREMENT LOAD ADDRESS
0002DC	58 1 0 C 378	L	R1,SRHADR	LOAD CYLINDER/TRACK ADR
0002E0	41 1 0 1 001	LA	R1,1(,R1)	INC CYLINDER/TRACK ADR BY 1
0002E4	50 1 0 C 378	ST	R1,SRHADR	SAVE CYLINDER/TRACK ADR
0002E8	58 8 0 C 134	S	R8,ENTRY1	DECREMENT COUNT ON # BLOCKS
0002EC	12 8 8	LTR	R8,R8	IS #/BLOCKS COUNTED DOWN TO 0?
0002EE	47 8 0 C 330	BC	8,ALLIN	BRANCH TO DMR/OPTION IFF LOADED
0002F2	47 F 0 C 2A2	BC	15,LOADS	LOAD-IN THE NEXT BLOCK

* LOADER I/O CHECKOUT CMD/STATUS/CCW ADR				

0002F6	58 4 0 D 000	COMPAR	R4,0(,R13)	CSW UPPER WORD (CMD,NXT CCW)
0002FA	58 3 0 1 000	L	R3,0(,R1)	GET LAST CCW TO BE SENT.
0002FE	54 4 0 C 118	N	R4,STSAND	AND-OUT ALL BUT CMD PART
000302	54 3 0 C 118	N	R3,STSAND	AND-OUT ALL BUT CMD PART
000306	19 3 4	CR	R3,R4	WAS CMD IN CSW = LAST SENT
000308	47 7 0 C 18C	BC	NEQ,CMDERR	BRANCH TO ERROR STOP IF NO
00030C	58 4 0 D 000	L	R4,0(,R13)	CSW UPPER WORD (CMD,NXT CCW)
000310	54 4 0 C 840	N	R4,LDFFFF	AND-OUT ANN BUT ADR/Nx CCW
000314	41 1 0 1 008	LA	R1,8(,R1)	ADD 8 TO ADR/LAST CCW SENT
000318	19 1 4	CR	R1,R4	NXT CCW ADR = LAST68 ?
00031A	47 7 0 C 1C4	BC	NEQ,CCWERR	BRANCH TO ERROR STOP IF NO

00031E	58 4 0 D 004	L	R4,4(,R13)	CSW LOWER WORD (STATUS)
000322	54 4 0 C 118	N	R4,STSAND	AND-OUT ALL BUT STATUS
000326	19 4 2	CR	R4,R2	STATUS = CHNL/DEVICE END?
000328	47 7 0 C 184	BC	NEQ,STSERR	BRANCH TO ERROR STOP IF NO
00032C	47 F 0 6 000	BC	15,0(,R6)	DONE.BRANCH TO EXIT ADDRESS
000330	47 F 0 5 000	BC	15,0(,R5)	BRANCH TO START OF DMR/OPTION
000334	58 1 0 C 1E0	LODMAR	R1,TWOK	MARS ARE AT CYL 02, TRACK 00
000338	50 1 0 C 378	IDLOAD	R1,SRHADR	SAVE CYLINDER/TRACK ADR.
00033C	41 0 0 C 3C0	LA	R0,LODCAL	GET CCW ADDRESS TO CAW
000340	40 C 0 C 3E2	STH	R12,READ+2	CLEAR BCW ADDRESS
000344	80 00 C 128	SSM	ANYP SW	ALLOW ANY I/O INTERRUPT
000348	47 F 0 0 F00	BC	15,3840(,0)	JUMP TO S/O & LOAD
00034C	18 4 2	DISCXX	R4,R2	GET RETURN ADR FOR WORKING CCW
00034E	18 0 1	LR	R0,R1	SAVE CCW ADDRESS IN CAW
000350	58 3 0 C 128	DISCIO	R3,ANYP SW	GET NEW PSW ; SYSTEM MASK
000354	56 4 0 C 12C	0	R4,ANYP SW+4	ADD CC TO RETURN ADR/NEW PSW
000358	50 3 0 0 0E8	ST	R3,NS2PSW(,0)	SAVE NEW PSW=SYSTEM MASK SEL 2
00035C	50 3 0 0 0D8	ST	R3,NS1PSW(,0)	SAVE NEW PSW=SYSTEM MASK SEL 1
000360	50 3 0 0 0E8	ST	R3,NS2PSW(,0)	SAVE NEW PSW=SYSTEM MASK SEL 2
000364	50 4 0 0 0DC	ST	R4,NS1PSW+4(,0)	SAVE NEW PSW=RETURN ADR SEL 1
000368	50 4 0 0 0EC	ST	R4,NS2PSW+4(,0)	SAVE NEW PSW=RETURN ADR SEL 2
00036C	80 00 C 1E8	SSM	FZZF	ALLOW ALL I/O INTERRUPTS
000370	47 F 0 0 F00	BC	15,3840(,0)	BRANCH TO SIO

* SIO CHECK (CCWS AND CODING)				

000374	00000000	DC	F'0'	
000378	00000000	SRHADR	X'00000000'	
00037C	01000000	DC	X'01000000'	
	000380	ORG	\$DMRDOP+896	SEARCH FOR RECORD 1
000380	58 8 0 C 19C	L	R8,MINUS1	SET ADDRESS TO HEX 380
000384	47 F 0 C 9A2	BC	15,SIOCHK	PICKUP CONSTANT FOR LOADER
		CNOP	0,8	GET LOAD DEVICE ADDRESS
000388	0700	CHAINX	X'0700'	ALIGN ON DOUBLE-WORD BOUNDARY
00038A	080E	DC	Y(TRACK0-2)	SEEK CMD...
00038C	00000006	DC	X'00000006'	CYL=00/TR=00/REC=00
000390	13000000	CAL	X'13000000'	6-BYTES , NO CHAINING
000394	00000000	DC	F'0'	RECALIBRATE CMD ...
000398	13000000	CHAINY	X'13000000'	
00039C	40000000	DC	X'40000000'	
0003A0	0700	DC	X'0700'	CHAIN FLAG SET
0003A2	080E	DC	Y(TRACK0-2)	SEEK CMD...
0003A4	00000006	DC	X'00000006'	CYL=00/TR=00/REC=00
0003A8	13000000	RECAL	X'13000000'	RECALIBRATE = %HOME ADDRESS)

0003AC 00000000
 0003B0 13000000
 0003B4 40000000
 0003B8 0800
 0003BA 03A0
 0003BC 40000000
 0003C0 13000000
 0003C4 40000000
 0003C8 0700
 0003CA 0376
 0003CC 40000000
 0003D0 3100
 0003D2 0378
 0003D4 40000005
 0003D8 0800
 0003DA 03D0
 0003DC 00000000
 0003E0 0600
 0003E2 0000
 0003E4 00000E10

0003E8 80 00 C 128
 0003EC 98 0 3 C B18
 0003F0 90 1 2 0 0B8
 0003F4 50 3 0 0 100
 0003F8 9C 00 0 080
 0003FC 47 F 0 C 3FC

TICX01 DC X'00000000'
 DC X'13000000'
 DC X'40000000'
 DC X'0800'
 DC Y(CHAINY+8)
 DC X'40000000'
 LODCAL DC X'13000000'
 DC X'40000000'
 SRHCCW DC X'0700'
 DC Y(SRHADR-2)
 DC X'40000000'
 SEARCH DC X'3100'
 DC Y(SRHADR)
 DC X'40000005'
 TIC DC X'0800'
 DC Y(SEARCH)
 DC X'00000000'
 READ DC X'0600'
 ADR DC X'0000'
 DC X'00000E10'
 *
 MARLOD SSM ANYPSW
 LM R0,R3,MSGDMR
 STM R1,R2,NHSPSW(0)
 ST R3,256(,0)
 SIO 128(0)
 BC 15,*

IMMEDIATE CMD=NO CHAIN/XFER

TIC TO RECALIBRATE

CHAIN FLAG SET (NO CHAIN XPTD)
 RECALIBRATE

SEARCH CMD (NXT CCHHR)
 ADR OF SEARCH BUFFER
 CHAIN (SKIP NXT CCW IF FIND)
 TIC BACK TO SEARCH,
 IF NO FIND IS MADE
 NO XFER FOR A TIC
 READ CMD (ALWAYS RECORD #1)
 ADDRESS TO READ INTO
 NO CHAIN. READ 3600 BYTES

ALLOW MPX-INTERRUPTS
 PICKUP MSG CONSTANTS
 SAVE NEW PSW DESIRED
 STORE SCW FOR CONSOLE
 PRINT *END DMR* MESSAGE
 WAIT FOR INTERRUPT

000400

EJECT
ORG

SDMRDOP+1024

SET ADDRESS TO HEX 400

BEGINNING OF 9400 DMR PRELUDE

000400	99	00	0	A0A
000404	47	8	0	C 42C
000408	07	8	0	
00040A	07	4	0	
00040C	07	2	0	
00040E	07	1	0	
000410	07	F	0	
000412	47	1	0	C 412
000416	47	2	0	C 416
00041A	47	4	0	C 41A
00041E	45	0	0	C 41E
000422	47	F	0	C 422
000426	82	00		C 426
00042A	0A	0F		
00042C	04	9	0	
00042E	07	7	1	
000430	07	8	2	
000432	04	B	0	
000434	07	2	7	
000436	04	A	0	
000438	07	4	3	
00043A	47	4	0	0 454
00043E	05	4	6	
000440	99	00		C 440
000444	12	4	4	
000446	07	7	F	
000448	99	00		C 448
00044C	99	00		C 44C
000450	99	00		C 450
000454	99	00		C 454
000458	99	00		C 458
00045C	07	0	6	
00045E	07	8	0	
000460	47	8	0	0 468
000464	99	00		C 464
000468	47	8	0	9 46C
00046C	99	00		C 46C
000470	04	A	0	

PREDMR	HPR	2570(0)
	BC	8,PRESPM
PREBCX	BCR	8,R13
	BCR	4,R13
	BCR	2,R13
	BCR	1,R13
	BCR	15,R13
	BC	1,*
	BC	2,*
	BC	4,*
	BAL	R13,*
	BC	15,*
	LPSW	*
PRESVC	SVC	15
PRESPM	SPM	R9
	BCR	7,R1
	BCR	8,R2
	SPM	R11
	BCR	2,R7
	SPM	R10
	BCR	4,R3
	BC	4,CONDC1(0,0)
	BALR	R4,R6
	HPR	
CCNOTO	LTR	R4,R4
	BCR	7,R15
	HPR	
CCODE2	HPR	
CCODE1	HPR	
CONDC1	HPR	
LINK	HPR	
BRANCH	BCR	0,R6
	BCR	8,R0
BCCCO	BC	8,BZONE(0,0)
	HPR	
BZONE	BC	8,BZERO(0,R9)
BZERO	HPR	
CCTO1	SPM	R10

- HALT BEFORE ENTERING PRELUDE
- OPERATOR SHOULD CLEAR CC AT IPL
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- ERROR BC/HPR FAILED FORCE LOOP
- CONDITION CODE SHOULD REMAIN 0
- CONDITION CODE ZERO, NO BRANCH
- BRANCH WITH CC EQUAL ZERO
- NO BRANCH, SET CC TO 2
- WILL A BRANCH OCCUR WITH CC = 2
- NO BRANCH, SET CC TO 1
- WILL A BRANCH WITH CC = 1 WORK
- NO, WILL A F OF 47 FUNCTION
- NO, TRY A BRANCH AND LINK
- NO BRANCH WILL FUNCTION
- SET CONDITION CODE TO 0
- IS CONDITION CODE ZERO
- NO, CONDITION CODE WONT CLEAR
- BRANCH WITH CC = 2 FUNCTIONS
- BRANCH WITH CC = 1 FUNCTIONS
- BC WITH CC = 1 FUNCTIONS
- BALR DOES BRANCH
- NO-OP SHOULD NOT BRANCH, R1 = 0
- NO-OP SHOULD NOT BRANCH, R2 = 0
- CHECK F EQUAL 47, CC STILL 0
- NO BRANCH
- CHECK F EQUAL 47, B2 EQUAL 4
- B2 DIDNT INCREMENT BRANCH ADDR

000472 47 8 0 C 482
 000476 47 3 0 C 490
 00047A 47 4 0 C 494
 00047E 99 00 C 47E
 000482 12 4 5
 000484 47 4 0 C 48C
 000488 99 00 C 488
 00048C 99 00 C 48C
 000490 99 00 C 490
 000494 04 8 0
 000496 47 0 0 C 4A2
 00049A 47 2 0 C 4A6
 00049E 99 00 C 49E
 0004A2 99 00 C 4A2
 0004A6 04 E 0
 0004A8 47 1 0 C 4B0
 0004AC 99 00 C 4AC
 0004B0 12 4 5
 0004B2 47 4 0 C 4D4
 0004B6 47 1 0 C 4C8
 0004BA 47 8 0 C 4CC
 0004BE 19 1 5
 0004C0 47 8 0 C 4D0
 0004C4 99 00 C 4C4
 0004C8 99 00 C 4C8
 0004CC 99 00 C 4CC
 0004D0 99 00 C 4D0
 0004D4 12 4 4
 0004D6 47 4 0 C 4E6
 0004DA 47 2 0 C 4E2
 0004DE 99 00 C 4DE
 0004E2 99 00 C 4E2
 0004E6 12 4 8
 0004E8 47 8 0 C 4FD
 0004EC 99 00 C 4EC
 0004F0 12 4 9
 0004F2 47 2 0 C 4FA
 0004F6 99 00 C 4F6
 0004FA 12 4 4
 0004FC 47 2 0 C 504
 000500 99 00 C 500
 000504 19 8 8
 000506 47 8 0 C 510
 00050A 1B 8 8

JPIFD BC 8,JPIFU
 BC 3,JPIF23
 BC 4,CCT02
 HPR
 LTR R4,R5
 BC 4,LTRCC1
 HPR
 LTRCC1 HPR
 JPIF23 HPR
 CCT02 SPM R11
 BC 13,JPIF13
 BC 2,CCT03
 HPR
 JPIF13 HPR
 CCT03 SPM R14
 BC 1,LOADR
 HPR
 LTR R4,R5
 BC 4,LOADR1
 BC 1,LOADR2
 BC 8,LOADR3
 CR R1,R5
 BC 8,LOADR4
 HPR
 LOADR2 HPR
 LOADR3 HPR
 LOADR4 HPR
 LOADR1 LTR R4,R4
 BC 4,LOADR0
 BC 2,LOADR5
 HPR
 LOADR5 HPR
 LOADR0 LTR R4,R8
 BC 8,LOADR9
 HPR
 LOADR9 LTR R4,R9
 BC 2,LOADR6
 HPR
 LOADR6 LTR R4,R4
 BC 2,COMPR
 HPR
 COMPR CR R8,R8
 BC 8,COMPR1
 SR R8,R8

HAS CONDITION CODE CHANGED?
 YES, IS IT 2 OR 3?
 BRANCH IF CC EQUALS 1
 • NO BRANCH
 SET CONDITION CODE TO 1
 BRANCH IF LTR SETS CC TO 1
 • PD 35 WILL NOT SET
 • PD 35 SET BY LTR BUT NOT BY SPM
 • CONDITION CODE EQUALS 2 OR 3
 SET CONDITION CODE TO 2
 IS CONDITION CODE 1 OR 3?
 NO, CHECK FOR CONDITION CODE 2
 • PD 34 NOT SET
 • PD 35 NOT CLEARED OR WAS SET
 IS CONDITION CODE = 3?
 • NO, CONDITION CODE 0,1 OR 2
 SET CC TO 1, R5 EQUALS =1
 DOES CC EQUAL 1?
 DOES CC STILL EQUAL 3?
 DOES CC EQUAL 0?
 SET CC TO 2, R1 > R5
 BRANCH IF CC ZERO
 • CC NOT SET BY COMPARE OR LTR
 • CC WAS NOT CLEARED OR SET RIGHT
 • CC WAS CLEARED BUT DIDNT RESET
 • CC EQUALED ZERO AFTER CR R1>R5
 WAS R4 LOADED WITH A NEGATIVE #
 CHECK CC WHICH SHOULD EQUAL 1
 CC DOESNT = 1, CHECK FOR POS #
 • R4 EQUAL ZERO OR CC WOULDNT SET
 • R4 POS, OR CC SET INCORRECTLY
 CC SHOULD BE 0, R8 EQUALS 0
 CHECK FOR CC = 0
 • CC NOT SET TO ZERO
 SET CC TO 2, R9 EQUALS 4
 WAS CC SET TO 2 BY LTR?
 • NO, ADDER OR PD 34 ENABLE ERROR
 WAS R4 LOADED WITH A POSITIVE #
 DOES CC = 0
 • NO, ADDER ERROR
 COMPARE R8 WITH R8, R8 EQUALS 0
 CC SHOULD EQUAL 0
 CC DOESNT EQUAL 0, SUBTRACT R8

```

00050C 99 00 8 000
000510 19 5 5
000512 47 8 0 C 51C
000516 18 5 5
000518 99 00 5 000
00051C 19 8 9
00051E 47 4 0 C 526
000522 99 00 C 522
000526 19 9 8
000528 47 2 0 C 530
00052C 99 00 C 52C
000530 59 8 0 C 804
000534 47 8 0 C 53C
000538 99 00 C 538
00053C 59 8 9 0 804
000540 47 4 0 C 548
000544 99 00 C 544
000548 59 9 8 0 804
00054C 47 2 0 C 554
000550 99 00 C 550
000554 58 4 0 C 19C
000558 19 4 5
00055A 47 8 0 C 562
00055E 99 00 C 55E
000562 58 4 0 C 804
000566 19 4 8
000568 47 8 0 C 570
00056C 99 00 C 56C
000570 18 4 5
000572 59 4 0 C 19C
000576 47 8 0 C 57E
00057A 99 00 C 57A
00057E 18 4 8
000580 59 4 0 C 804
000584 47 8 0 C 58C
000588 99 00 C 588
00058C 1A 4 5
00058E 19 4 5
000590 47 7 0 C 58A
000594 1A 4 8
000596 19 4 5
000598 47 8 0 C 5A0
00059C 99 00 C 59C
0005A0 18 4 8

```

```

COMPR1 HPR 0(R8)
CR R5,R5
BC 8,COMPR2
SR R5,R5
HPR 0(R5)
COMPR2 CR R8,R9
BC 4,COMPR3
HPR
COMPR3 CR R9,R8
BC 2,COMP
HPR
COMP C R8,ZEROS
BC 8,COMP1
HPR
COMP1 C R8,ZEROS(R9,0)
BC 4,COMP2
HPR
COMP2 C R9,ZEROS(R8,0)
BC 2,LOAD
HPR
LOAD L R4,MINUS1
CR R4,R5
BC 8,LOAD1
HPR
LOAD1 L R4,ZEROS
CR R4,R8
BC 8,LOADR7
HPR
LOADR7 LR R4,R5
C R4,MINUS1
BC 8,LOADR8
HPR
LOADR8 LR R4,R8
C R4,ZEROS
BC 8,ADD
HPR
ADD AR R4,R5
CR R4,R5
BC NZERO,ERR
AR R4,R8
CR R4,R5
BC ZERO,AR1
HPR
AR1 LR R4,R8

```

- FROM R8, DISPLAY RESULT IN A0.
- COMPARE MINUS ONE AND MINUS ONE
- CC SHOULD EQUAL ZERO
- CC DOESNT EQUAL ZERO
- DISPLAY DIFFERENCE IN A0
- R8 = 0 < R9 = 4
- CC SHOULD EQUAL 1
- CC DID NOT SET PROPERLY
- R9 = 4 > R8 = 0
- CC SHOULD EQUAL 2
- CC WAS NOT SET CORRECTLY
- CHECK RX COMPARE
- CC SHOULD BE ZERO
- CC IMPROPERLY SET
- COMPARE 0 WITH 4 (R9=4)
- CC SHOULD EQUAL 1
- PD 35 WAS NOT SET
- COMPARE 4 WITH 0 (R8=0)
- CC SHOULD EQUAL 2
- PD 34 WAS NOT SET
- LOAD R4 WITH MINUS ONE
- WAS R4 LOADED CORRECTLY?
- CC SHOULD EQUAL 0
- R4 WAS NOT LOADED WITH MINUS 1
- LOAD R4 WITH ZERO
- WAS R4 LOADED CORRECTLY?
- CC SHOULD EQUAL 0
- R4 DOES NOT EQUAL ZERO
- LOAD R4 WITH MINUS ONE
- WAS R4 LOADED CORRECTLY
- CC SHOULD EQUAL 0
- R4 INCORRECTLY LOADED
- LOAD R4 WITH ZERO
- COMPARE R4 WITH ZERO
- CC SHOULD EQUAL 0
- R4 WAS NOT ZERO
- ADD, D=FFFF, B=ZEROS
- TOTAL EQUAL FFFF
- ADDITION NOT CORRECT
- ADD,D=ZEROS, B=+FFF
- TOTAL EQUAL FFFF
- CONTINUE TEST
- 0+F ADDS, F+0 DOESN'T
- CLEAR R4

```

0005A2  1A 4 0
0005A4  47 8 0 C 5AC
0005A8  99 00 C 5A8
0005AC  5A 4 0 C 19C
0005B0  19 4 5
0005B2  47 8 0 C 5EC
0005B6  99 00 C 5B6
0005BA  18 4 0
0005BC  5A 4 0 C B04
0005C0  19 4 5
0005C2  47 8 0 C 5E4
0005C6  18 4 5
0005C8  1A 4 8
0005CA  19 4 5
0005CC  47 8 0 C 5E8
0005D0  18 4 8
0005D2  1A 4 8
0005D4  47 8 0 C 5DC
0005D8  99 00 C 5D8
0005DC  18 4 8
0005DE  1A 4 5
0005E0  99 00 C 5E0
0005E4  99 00 C 5E4
0005E8  99 00 C 5E8

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```

0005EC  58 4 0 C 1DC
0005F0  5A 4 0 C 1DC
0005F4  59 4 0 C B38
0005F8  47 8 0 C 600
0005FC  99 00 C 5FC
000600  58 4 0 C B44
000604  5A 4 0 C B48
000608  59 4 0 C B38
00060C  47 8 0 C 614
000610  99 00 C 610
000614  58 4 0 C B4C
000618  5A 4 0 C B50
00061C  59 4 0 C B38
000620  47 8 0 C 628
000624  99 00 C 624
000628  58 4 0 C B54
00062C  5A 4 0 C B58

```

```

A1      AR      R4,R8      ADD ZERO PLUS ZERO
        BC      ZERO,A1
        HPR
        A      R4,MINUS1
        CR      R4,R5
        BC      ZERO,A2
        HPR
ERR      LR      R4,R8
        A      R4,ZEROS
        CR      R4,R5      TOTAL EQUAL FFFF
        BC      ZERO,ARERR
        LR      R4,R5      SET R4 TO ONES
        AR      R4,R8      ADD, D=ZEROS, B=FFFF
        CR      R4,R5      TOTAL EQUAL FFFF
        BC      ZERO,PATERR  BRANCH IF PATTERN ERROR
        LR      R4,R8      DO ZEROS ADD CORRECTLY
        AR      R4,R8
        BC      ZERO,CZERR   ZEROS ADD, PATTERNS DON'T
        HPR
        LR      R4,R8      * ZEROS AND ONES BOTH ADD WRONG
        AR      R4,R5      RESET ERROR CONDITIONS
        HPR
        HPR
        HPR      * ZEROS ADD, PATTERNS DON'T
        HPR      * INSTRUCTION A WORKS, AR DOESN'T
        HPR      * 0+1 ADDS, 1+0 ADDS WRONG
        * .....
        *      CHECK DO ADDER CIRCUITRY
        * .....
A2      L      R4,ZROEGT    CONTINUE CHECKING ERROR PATTERN
        A      R4,ZROEGT    00008888 PLUS 00008888
        C      R4,TOT1
        BC      ZERO,CHECK2
        HPR
CHECK2   L      R4,=X'0000EEEE'
        A      R4,=X'00002222'
        C      R4,TOT1
        BC      ZERO,CHECK3
        HPR
CHECK3   L      R4,=X'0000CCCC'
        A      R4,=X'00004444'
        C      R4,TOT1
        BC      ZERO,CHECK4
        HPR
CHECK4   L      R4,=X'00F0F00F'
        A      R4,=X'00101001'

```

```

* ADD WORKS, ZERO, + ZERO, DON'T
ADD, D=FFFF, B=ZEROS
TOTAL EQUAL FFFF

* AR INSTRUCTION WORKS, A DOESN'T
CHECK IF A INSTRUCTION WORKS

TOTAL EQUAL FFFF

SET R4 TO ONES
ADD, D=ZEROS, B=FFFF
TOTAL EQUAL FFFF
BRANCH IF PATTERN ERROR
DO ZEROS ADD CORRECTLY

ZEROS ADD, PATTERNS DON'T
* ZEROS AND ONES BOTH ADD WRONG
RESET ERROR CONDITIONS

* ZEROS ADD, PATTERNS DON'T
* INSTRUCTION A WORKS, AR DOESN'T
* 0+1 ADDS, 1+0 ADDS WRONG

CONTINUE CHECKING ERROR PATTERN
00008888 PLUS 00008888

* SUM NOT EQUAL TO 00011110
ADD 0000EEEE PLUS 00002222

* SUM NOT EQUAL TO 00011110
ADD 0000CCCC PLUS 00004444

* SUM NOT EQUAL TO 00011110
ADD 00F0F00F PLUS 00101001

```

000630	59 4 0 C B5C	C	R4,=X'01010010'	
000634	47 8 0 C 63C	BC	ZERO,CHECK5	
000638	99 00 C 638	HPR		• SUM NOT EQUAL TO 01010010
00063C	58 4 0 C 860	L	R4,=X'0F800080'	
000640	5A 4 0 C 864	A	R4,=X'00800080'	ADD 0F800080 PLUS 00800080
000644	59 4 0 C 868	C	R4,=X'10000100'	
000648	47 8 0 C 650	BC	ZERO,CHECK6	
00064C	99 00 C 64C	HPR		• SUM NOT EQUAL TO 10000100
000650	58 4 0 C 86C	L	R4,=X'0F008000'	
000654	5A 4 0 C 870	A	R4,=X'01008000'	ADD 0F008000 PLUS 01008000
000658	59 4 0 C 800	C	R4,ONE001	
00065C	47 8 0 C 664	BC	ZERO,CHECK7	
000660	99 00 C 660	HPR		• SUM NOT EQUAL TO 10010000
000664	58 4 0 C 874	L	R4,=X'0FF80800'	
000668	5A 4 0 C 878	A	R4,=X'00080800'	ADD 0FF80800 PLUS 00080800
00066C	59 4 0 C 87C	C	R4,=X'10001000'	
000670	47 8 0 C 678	BC	ZERO,CHECK8	
000674	99 00 C 674	HPR		• SUM NOT EQUAL TO 10001000
000678	58 4 0 C 880	L	R4,=X'0FFF8000'	
00067C	5A 4 0 C 83C	A	R4,ZERO8	ADD 0FFF8000 PLUS 00008000
000680	59 4 0 C 884	C	R4,=X'10000000'	
000684	47 8 0 C 68C	BC	ZERO,CHECK9	
000688	99 00 C 688	HPR		• SUM NOT EQUAL TO 10000000
00068C	58 4 0 C 888	L	R4,=X'00F8000F'	
000690	5A 4 0 C 88C	A	R4,=X'00080001'	ADD 00F8000F PLUS 00080001
000694	59 4 0 C 890	C	R4,=X'01000010'	
000698	47 8 0 C 6A0	BC	ZERO,CHCK10	
00069C	99 00 C 69C	HPR		• SUM NOT EQUAL TO 01000010
0006A0	58 4 0 C 894	L	R4,=X'00FF8000'	
0006A4	5A 4 0 C 83C	A	R4,ZERO8	ADD 00FF8000 PLUS 00008000
0006A8	59 4 0 C 898	C	R4,=X'01000000'	
0006AC	47 8 0 C 684	BC	ZERO,CHCK11	
0006B0	99 00 C 680	HPR		• SUM NOT EQUAL TO 01000000
0006B4	58 4 0 C 89C	L	R4,=X'000F8000'	
0006B8	5A 4 0 C 83C	A	R4,ZERO8	ADD 000F8000 PLUS 00008000
0006BC	59 4 0 C 8A0	C	R4,=X'00100000'	
0006C0	47 8 0 C 6C8	BC	ZERO,CHCK12	
0006C4	99 00 C 6C4	HPR		• SUM NOT EQUAL TO 00100000
0006C8	58 4 0 C 8A4	L	R4,=X'22222222'	
0006CC	5A 4 0 C 8A8	A	R4,=X'6666AAAA'	ADD 22222222 PLUS 6666AAAA
0006D0	59 4 0 C 1E4	C	R4,EIGHTC	
0006D4	47 8 0 C 60C	BC	ZERO,CHCK13	
0006D8	99 00 C 6D8	HPR		• SUM NOT EQUAL TO 8888CCCC
0006DC	58 4 0 C 8AC	L	R4,=X'44440000'	

0006E0	5A 4 0 C B80	A	R4,=X'4444CCCC'	ADD 44440000 PLUS 4444CCCC
0006E4	59 4 0 C 1E4	C	R4,EIGHTC	
0006E8	47 8 0 C 6F0	BC	ZERO,CHCK14	• SUM NOT EQUAL TO 8888CCCC
0006EC	99 00 C 6EC	HPR		
0006F0	58 4 0 C 8B4	L	R4,=X'8888BBBB'	ADD 8888BBBB PLUS 00001111
0006F4	5A 4 0 C 1D8	A	R4,ZERONE	
0006F8	59 4 0 C 1E4	C	R4,EIGHTC	
0006FC	47 8 0 C 704	BC	ZERO,CHCK15	• SUM NOT EQUAL TO 8888CCCC
000700	99 00 C 700	HPR		
000704	58 4 0 C 888	L	R4,=X'77770008'	ADD 77770008 PLUS 11110008
000708	5A 4 0 C 88C	A	R4,=X'11110008'	
00070C	59 4 0 C 8C0	C	R4,=X'88880010'	
000710	47 8 0 C 718	BC	ZERO,CHCK16	• SUM NOT EQUAL TO 88880010
000714	99 00 C 714	HPR		
000718	58 4 0 C 8C4	L	R4,=X'EEEEDDDD'	ADD EEEEEDDD PLUS 00001111
00071C	5A 4 0 C 1D8	A	R4,ZERONE	
000720	59 4 0 C 8C8	C	R4,=X'EEEEEEEE'	
000724	47 8 0 C 72C	BC	ZERO,CHCK17	• SUM NOT EQUAL TO EEEEEEEE
000728	99 00 C 728	HPR		
00072C	58 4 0 C AF8	L	R4,HFONES	ADD 00007FFF PLUS FFFF7FFF
000730	5A 4 0 C BCC	A	R4,=X'FFFF7FFF'	
000734	59 4 0 C BD0	C	R4,=X'FFFFFFFFE'	
000738	47 8 0 C 740	BC	ZERO,CHCK18	• SUM NOT EQUAL TO FFFFFFFF
00073C	99 00 C 73C	HPR		
000740	58 4 0 C 1E8	L	R4,FZZF	ADD FF0000FF PLUS 00000000
000744	1A 4 8	AR	R4,R8	
000746	59 4 0 C 1E8	C	R4,FZZF	
00074A	47 8 0 C 752	BC	ZERO,CHCK19	• SUM NOT EQUAL TO FF0000FF
00074E	99 00 C 74E	HPR		
000752	58 4 0 C BD4	L	R4,=X'33336666'	ADD 33336666 PLUS 11112222
000756	5A 4 0 C BD8	A	R4,=X'11112222'	
00075A	59 4 0 C BDC	C	R4,=X'44448888'	
00075E	47 8 0 C 766	BC	ZERO,CHCK21	• SUM NOT EQUAL TO 44448888
000762	99 00 C 762	HPR		
000766	58 4 0 C BE0	L	R4,=X'0F019998'	ADD 0F019998 PLUS 01008888
00076A	5A 4 0 C 8E4	A	R4,=X'01008888'	
00076E	59 4 0 C BE8	C	R4,=X'10022220'	
000772	47 8 0 C 77A	BC	ZERO,CHCK22	• SUM NOT EQUAL TO 10022220
000776	99 00 C 776	HPR		
00077A	58 4 0 C BEC	L	R4,=X'00088088'	ADD 00088088 PLUS 00008008
00077E	5A 4 0 C 1CC	A	R4,FZEA	
000782	59 4 0 C BFD	C	R4,=X'000C00C0'	
000786	47 8 0 C 78E	BC	ZERO,CHCK23	• SUM NOT EQUAL TO 000C00C0
00078A	99 00 C 78A	HPR		

```

00078E 58 4 0 C BF4
000792 5A 4 0 C 1CC
000796 59 4 0 C BF8
00079A 47 8 0 C 7A2
00079E 99 00 C 79E
0007A2 58 4 0 C BFC
0007A6 5A 4 0 C 1CC
0007AA 59 4 0 C C00
0007AE 47 8 0 C 7B6
0007B2 99 00 C 7B2
0007B6 58 4 0 C C04
0007BA 5A 4 0 C 1CC
0007BE 59 4 0 C C08
0007C2 47 8 0 C 7CA
0007C6 99 00 C 7C6
0007CA 58 4 0 C C0C
0007CE 5A 4 0 C 1D0
0007D2 59 4 0 C C10
0007D6 47 8 0 C 7DE
0007DA 99 00 C 7DA
0007DE 58 4 0 C C14
0007E2 5A 4 0 C 1D0
0007E6 59 4 0 C C18
0007EA 47 8 0 C 7F2
0007EE 99 00 C 7EE
0007F2 58 4 0 C C1C
0007F6 5A 4 0 C 1D0
0007FA 59 4 0 C C20
0007FE 47 8 0 C 806
000802 99 00 C 802
000806 58 4 0 C C24
00080A 5A 4 0 C 1D0
00080E 59 4 0 C C28
000812 47 8 0 C 81A
000816 99 00 C 816
00081A 58 4 0 C C2C
00081E 5A 4 0 C C30
000822 59 4 0 C B00
000826 47 8 0 C 82E
00082A 99 00 C 82A
00082E 18 4 8
000830 18 4 5
000832 59 4 0 C 0D4
000836 47 8 0 C 864

```

```

CHCK23 L R4,=X'000D80D8'
A R4,FZEA ADD 000D80D8 PLUS 00008008
C R4,=X'000E00E0'
BC ZERO,CHCK24
HPR
CHCK24 L R4,=X'000E80E8'
A R4,FZEA ADD 000E80E8 PLUS 00008008
C R4,=X'000F00F0'
BC ZERO,CHCK25
HPR
CHCK25 L R4,=X'00078078'
A R4,FZEA ADD 00078078 PLUS 00008008
C R4,=X'00080080'
BC ZERO,CHCK26
HPR
CHCK26 L R4,=X'0B80B800'
A R4,SZEA ADD 0B80B800 PLUS 00800800
C R4,=X'0C00C000'
BC ZERO,CHCK27
HPR
CHCK27 L R4,=X'0D80D800'
A R4,SZEA ADD 0D80D800 PLUS 00800800
C R4,=X'0E00E000'
BC ZERO,CHCK28
HPR
CHCK28 L R4,=X'0E80E800'
A R4,SZEA ADD 0E80E800 PLUS 00800800
C R4,=X'0F00F000'
BC ZERO,CHCK29
HPR
CHCK29 L R4,=X'07807800'
A R4,SZEA ADD 07807800 PLUS 00800800
C R4,=X'08008000'
BC ZERO,CHCK30
HPR
CHCK30 L R4,=X'0F00FF80'
A R4,=X'01000080'
C R4,ONE001
BC ZERO,SUB1
HPR
SUB1 LR R4,R8
SR R4,R5
C R4,PLUS1
BC ZERO,SUB2

```

• SUM NOT EQUAL TO 000E00E0
ADD 000E80E8 PLUS 00008008

• SUM NOT EQUAL TO 000F00F0
ADD 00078078 PLUS 00008008

• SUM NOT EQUAL TO 00080080
ADD 0B80B800 PLUS 00800800

• SUM NOT EQUAL TO 0C00C000
ADD 0D80D800 PLUS 00800800

• SUM NOT EQUAL TO 0E00E000
ADD 0E80E800 PLUS 00800800

• SUM NOT EQUAL TO 0F00F000
ADD 07807800 PLUS 00800800

• SUM NOT EQUAL TO 08008000

NEXT CHECK SUBTRACT INSTRUCTION

• TEST SUBTRACT INSTRUCTIONS
SUBTRACT MINUS ONE FROM ZERO
RESULT RIGHT
CONTINUE TESTING SUBTRACT

```

00083A 18 4 8
00083C 58 4 0 C 19C
000840 59 4 0 C 0D4
000844 47 8 0 C 85C
000848 18 4 8
00084A 18 4 8
00084C 47 8 0 C 854
000850 99 00 C 850
000854 18 4 8
000856 18 4 5
000858 99 00 C 858
00085C 18 4 8
00085E 18 4 5
000860 99 00 C 860
000864 18 4 8
000866 58 4 0 C 19C
00086A 47 2 0 C 872
00086E 99 00 C 86E
000872 18 4 8
000874 18 4 8
000876 47 8 0 C 87E
00087A 99 00 C 87A
00087E 18 4 8
000880 58 4 0 C 0D4
000884 47 4 0 C 88C
000888 99 00 C 888
00088C 50 5 0 0 E2C
000890 59 5 0 0 E2C
000894 47 8 0 C 8B0
000898 50 8 0 0 E2C
00089C 59 8 0 0 E2C
0008A0 47 8 0 C 8A8
0008A4 99 00 C 8A4
0008A8 50 5 0 0 E2C
0008AC 99 00 C 8AC
0008B0 50 8 0 0 E2C
0008B4 59 8 0 0 E2C
0008B8 47 8 0 C 8C0
0008BC 99 00 C 8BC
0008C0 18 4 8
0008C2 54 4 0 C 8D4
0008C6 47 8 0 C 8E6
0008CA 18 4 5
0008CC 54 4 0 C 19C

```

```

LR R4,R8
S R4,MINUS1
C R4,PLUS1
BC ZERO,SRNR
LR R4,R8
SR R4,R8
BC ZERO,NGERR
HPR
NGERR LR R4,R8
SR R4,R5
HPR
SRNR LR R4,R8
SR R4,R5
HPR
SUB2 LR R4,R8
S R4,MINUS1
BC POSIT,SUB3
HPR
SUB3 LR R4,R8
SR R4,R8
BC ZERO,SUB4
HPR
SUB4 LR R4,R8
S R4,PLUS1
BC NEG,ST1
HPR
ST1 ST R5,EXTRA(,0)
C R5,EXTRA(,0)
BC ZERO,ST2
ST R8,EXTRA(,0)
C R8,EXTRA(,0)
BC ZERO,STER1
HPR
STER1 ST R5,EXTRA(,0)
HPR
ST2 ST R8,EXTRA(,0)
C R8,EXTRA(,0)
BC ZERO,N1
HPR
N1 LR R4,R8
N R4,ZEROS
BC ZERO,N2
LR R4,R5
N R4,MINUS1

```

SR INSTRUCTION DOESN'T WORK

SUBTRACT ZERO FROM ZERO

• SR AND S BOTH DON'T WORK

RESET ERROR CONDITIONS

• ZEROS SUBTRACT, MINUS ONE WRONG

RESET ERROR CONDITIONS

• S INSTRUCTION WORKS, SR DOESN'T
TEST S INSTRUCTION

• COND CODE OR S INST ERROR

SUBTRACT ZERO FROM ZERO

NEXT CHECK STORE INSTRUCTION

• MINUS ONE SUBTRACTS! ZERO WRONG
CHECK NEGATIVE CONDITION CODE

NEXT CHECK STORE INSTRUCTION

• ERROR IN NEGATIVE CONDITION CD
STORE ALL ONES
CHECK STORED INFORMATION
BRANCH IF ALL ONES IN STORAGE
STORE ALL ZEROES
CHECK STORED INFORMATION

• NO CORRECT STORAGE

SET UP ERROR CONDITIONS

• ONLY ZEROS STORE CORRECTLY
STORE ALL ONES
CHECK STORED INFORMATION

• ONLY ONES STORE CORRECTLY

AND TOGETHER ZEROS AND ZEROS
CONTINUE TESTING AND (N)

AND TOGETHER ONES AND ONES

```

000800 59 4 0 C 19C
000804 47 8 0 C 8DC
000808 99 00 C 808
00080C 18 4 8
00080E 54 4 0 C 804
000812 99 00 C 8E2
000816 18 4 5
000818 54 4 0 C 804
00081C 47 8 0 C 8F4
000820 99 00 C 8F0
000824 18 4 5
000828 54 4 0 C 19C
00082C 47 7 0 C 902
000830 99 00 C 8FE
000834 19 4 5
000838 47 8 0 C 90C
00083C 99 00 C 908
000840 18 4 8
000844 56 4 0 C 804
000848 47 8 0 C 932
000852 18 4 5
000856 56 4 0 C 19C
000860 19 4 5
000864 07 0 1
000868 47 8 0 C 928
00086C 99 00 C 924
000870 18 4 8
000874 56 4 0 C 804
000878 99 00 C 92E
000882 18 4 5
000886 56 4 0 C 804
000890 19 4 5
000894 47 8 0 C 942
000898 99 00 C 93E
000902 18 4 8
000906 56 4 0 C 19C
000910 19 4 5
000914 47 8 0 C 952
000918 99 00 C 94E
000922 18 4 5
000926 56 4 0 C 19C
000930 59 4 0 C 19C
000934 47 8 0 C 964
000938 99 00 C 960

```

```

C R4,MINUS1
BC ZERO,N1ERR
HPR
N1ERR LR R4,R8
N N R4,ZEROS
HPR
N2 LR R4,R5
N R4,ZEROS
BC ZERO,N3
HPR
N3 LR R4,R5
N R4,MINUS1
BC NZERO,N4
HPR
N4 CR R4,R5
BC ZERO,O1
HPR
O1 LR R4,R8
O R4,ZEROS
BC ZERO,O2
LR R4,R5
O R4,MINUS1
CR R4,R5
BCR O,R1
BC ZERO,O1ERR1
HPR
O1ERR1 LR R4,R8
O R4,ZEROS
HPR
O2 LR R4,R5
O R4,ZEROS
CR R4,R5
BC ZERO,O3
HPR
O3 LR R4,R8
O R4,MINUS1
CR R4,R5
BC ZERO,O4
HPR
O4 LR R4,R5
O R4,MINUS1
C R4,MINUS1
BC ZERO,LA1
HPR

```

CHECK RESULT

- INSTRUCTION NOT WORKING
- SET UP ERROR CONDITION
- ONLY ZEROS DON'T AND CORRECTLY SET R4 TO ONES AND TOGETHER ZEROS AND ONES CONTINUE TEST
- ZEROS AND ONES NOT CORRECT
- AND TOGETHER ONES PLUS ONES
- ONES PLUS ONES NOT CORRECT
- ONES PLUS ONES NOT CORRECT BEGIN TESTING OR INSTRUCTION
- BRANCH IF CORRECT RESULT
- RESULT SHOULD EQUAL ALL ONES
- ONLY ZEROS DON'T OR CORRECTLY SET UP ERROR CONDITIONS OR TOGETHER ZEROS PLUS ZEROS
- INCORRECT RESULT (ZEROS OR ONE) SET R4 TO ONES OR TOGETHER ZEROS PLUS ONES
- INCORRECT RESULT (ONES OR ZERO) SET R4 TO ZEROS
- RESULT EQUAL TO ALL ONES
- INSTRUCTION DOESN'T WORK
- OR TOGETHER ONES PLUS ONES
- ONES OR ONES GIVE WRONG RESULT

```

000964 41 4 0 0 FFF
000968 59 4 0 C 104
00096C 47 8 0 C 994
000970 48 4 0 C 19C
000974 59 4 0 C 0E4
000978 47 8 0 C 980
00097C 99 00 C 97C
000980 41 4 0 0 000
000984 59 4 0 C B04
000988 47 8 0 C 990
00098C 99 00 C 98C
000990 99 00 C 990
000994 41 4 0 9 000
000998 19 4 9
00099A 47 8 0 C 9A2
00099E 99 00 C 99E

```

```

0009A2 58 D 0 C B04
0009A6 58 A 0 0 038
0009AA 54 A 0 C 034
0009AE 47 7 0 C 9CA
0009B2 58 E 0 0 038
0009B6 54 E 0 C AF0
0009BA 41 E 0 E 100
0009BE 58 F 0 0 038
0009C2 54 F 0 C 024
0009C6 47 F 0 C A0A
0009CA 58 E 0 C B04
0009CE 58 A 0 0 058
0009D2 54 A 0 C 034
0009D6 47 7 0 C 9EE
0009DA 41 D 0 0 1A0
0009DE 58 F 0 0 058
0009E2 54 F 0 C 024
0009E6 41 F 0 F 100
0009EA 47 F 0 C A0A
0009EE 58 A 0 0 068
0009F2 54 A 0 C 034
0009F6 47 7 0 C AD4
0009FA 41 D 0 0 1A8
0009FE 58 F 0 0 068
000A02 54 F 0 C 024

```

```

LA1      LA      R4,4095(,0)      BEGIN TESTING LA INSTRUCTION
          C        R4,OFFF        CONSTANT SHOULD BE LOADED
          BC       ZERO,LA2        CONTINUE TESTING IF OK
          LH       R4,MINUS1        ISOLATE FAULT
          C        R4,SXONES        CHECK IF LH WORKS
          BC       ZERO,LAERR
          HPR
LAERR     LA      R4,0000(,0)      * NEITHER LA NOR LH WORKS
          C        R4,ZEROS        CHECK IF ZEROES LOAD CORRECTLY
          BC       ZERO,LAERR2
          HPR
LAERR2    HPR
LA2       LA      R4,0000(0,R9)    CONTINUE ISOLATION
          CR       R4,R9           * NEITHER ONES NOR ZEROS LOAD
          BC       ZERO,SIOCHK     * ZEROS LOAD OK ONES DON'T
          HPR                                     TOTAL EQUAL CONTENTS OF R99
                                                SHOULD BE EQUAL
                                                COMPARE HALF INSTRUCTION WORKS
                                                * ADD MODIFICATION ERROR
*****
* DETERMINE INITIAL LOAD CHANNEL AND BEGIN SIO CHECK
*****
SIOCHK    L        R13,ZEROS      CLEAR SUPERVISOR REGISTER 13
          L        R10,0MSPSW(,0) CHECK FOR INITIAL LOAD CHANNEL
          N        R10,FF00        WAS INIAL LOAD FROM MPX?
          BC       NONZ,SELTR      IF CC NOT ZERO, LOAD FROM SELTR
          L        R14,0MSPSW(,0) LOAD OLD MPX SHARED PSW
          N        R14,SCWMSK      OBTAIN SCW ADDRESS
          LA       R14,256(,R14)   R14 EQUALS ADDRESS OF MPX CSW
          L        R15,0MSPSW(,0) OBTAIN CHAN AND DEVICE NUMBER
          N        R15,FF          R15 EQUALS CHANNEL AND DEVICE #
          BC       UNCOND,RESRVE   SAVE DEVICE AND CHAN AND SCW
          L        R14,ZEROS      CLEAR SUPERVISOR REGISTER 14
          L        R10,0S1PSW(,0) WAS INITIAL LOAD FROM SEL #1?
          N        R10,FF00
          BC       NONZ,SELTRZ     IF CC ZERO, LOAD FROM SEL #1
          LA       R13,416(,0)     R13 EQUALS ADDRESS OF CSW
          L        R15,0S1PSW(,0) OBTAIN CHANNEL AND DEVICE #
          N        R15,FF          R15 EQUALS DEVICE#
          LA       R15,256(,R15)   R15 EQUALS CHANNEL AND DEVICE #
          BC       UNCOND,RESRVE   SAVE CHANNEL AND DEVICE AND CSW
          L        R10,0S2PSW(,0) WAS INITIAL LOAD FROM SEL #2?
          N        R10,FF00
          BC       NONZ,ILLEGL     IF CC ZERO, LOAD FROM SEL #2
          LA       R13,424(,0)     R13 EQUALS ADDRESS OF CSW
          L        R15,0S2PSW(,0) OBTAIN CHANNEL AND DEVICE #
          N        R15,FF          R15 EQUALS DEVICE #

```

```

000A06 41 F 0 F 200
000A0A 50 D 0 0 E20
000A0E 50 E 0 0 E24
000A12 50 F 0 0 E28
000A16 58 1 0 C 044
000A1A 50 1 0 0 F00
000A1E 58 1 0 C 054
000A22 50 1 0 0 F04
000A26 58 1 0 C 210
000A2A 48 8 0 0 082
000A2E 12 8 8
000A30 47 4 0 C 338
000A34 47 2 0 C 334

000A38 9C 00 0 3FF
000A3C 47 1 0 C A44
000A40 99 00 C A40
000A44 12 A E
000A46 47 8 0 C A7C
000A4A 41 A 0 C A08
000A4E 50 A 0 0 0BC
000A52 41 A 0 C AFC
000A56 50 A 0 E 000
000A5A 41 0 0 0 003
000A5E 9C 00 F 000
000A62 47 4 0 C A6A
000A66 99 00 C A66
000A6A 41 A 0 0 003
000A6E 56 A 0 C 124
000A72 19 0 A
000A74 47 8 0 C C54
000A78 99 00 C A78
000A7C 41 A 0 C ADC
000A80 50 A 0 0 0DC
000A84 50 A 0 0 0EC
000A88 50 A 0 0 000
000A8C 58 A 0 C 19C
000A90 50 A 0 0 004
000A94 41 0 0 C AEO
000A98 9C 00 F 000
000A9C 47 4 0 C AA4
000AA0 99 00 C AA0
000AA4 41 A 0 C AEO
000AA8 56 A 0 C 124

```

RESERVE

MPXSEL

SUTATS

CHKSEL

SELSTA

```

LA R15,512(,R15)
ST R13,LODR13(,0)
ST R14,LODR14(,0)
ST R15,LODR15(,0)
L R1,XQTSIO
ST R1,3840(,0)
L R1,JMPF04
ST R1,3844(,0)
L R1,IDS
LH R8,SBABS+2(,0)
LTR R8,R8
BC 4,1DL0AD
BC 2,LODMAR

SIO 1023(0)
BC 1,MPXSEL
HPR
LTR R10,R14
BC ZERO,CHKSEL
LA R10,ILLINT
ST R10,NMSPSW+4(,0)
LA R10,MUXBCW
ST R10,0(,R14)
LA R0,3(,0)
SIO 0(R15)
BC 4,SUTATS
HPR
LA R10,3(,0)
O R10,STATUS
CR R0,R10
BC EQL,MEMORY
HPR
LA R10,SELINT
ST R10,NS1PSW+4(,0)
ST R10,NS2PSW+4(,0)
ST R10,0(,R13)
L R10,MINUS1
ST R10,4(,R13)
LA R0,SLXCCW
SIO 0(R15)
BC 4,SELSTA
HPR
LA R10,SLXCCW
O R10,STATUS

```

```

R15 EQUALS CHANNEL AND DEVICE#
ADDR OF CSW (MPX = 0)
ADDR OF SCW (SEL = 0)
CHANNEL AND DEVICE NUMBER
GET START I/O INSTRUCTION
STORE AT HEX ADR=0F00
GET WAIT INSTRUCTION
STORE IT AT HEX ADR = 0F04
IF SERVICE ROUTINES, GET ADR
GET RID OF ANY GARBAGE IN TOP
ARE MARS TO BE LOADED?
LOAD 9400 SERVICE ROUTINES NOW
LOAD IN MARS NOW
CHECK START I/O (R8 WAS 0)
SIO TO CHANNEL 3 (NON=EXISTENT)
CC SHOULD = 3, NOT OPERATIONAL
• CC NOT 3 OR SIO MALFUNCTION
CHECK FOR MPX OR SEL
IF R14 EQUALS ZERO, SELECTOR CH
LOAD R10 WITH ADDR FOR MPX INT
STORE IN NEW MPX SHARED PSW
MPX SCW TO R10
STORE AT PROPER ADDRESS
LOAD CAW (R0) WITH NO=OP
SEND NO=OP, IMMEDIATE CONTROL
COMMAND, CONTROL UNIT RETURNS
• CHANNEL AND DEVICE END, CC = 1
LOAD R10 WITH NO=OP COMMAND
ADD DEVICE AND CHANNEL END
CHECK CAW FOR DEVICE AND CHAN-
NEL END, CC SHOULD EQUAL 0
• DEVICE OR CHAN END NOT STORED
LOAD R10 WITH ADDR FOR SEL INT
STORE IN NEW SELECTOR CHANNEL
ONE AND TWO PSW ADDRESS
STORE IN SELECTOR CHANNEL
ALL F'S TO R10
STATUS WORD
LOAD R0 WITH SELECTOR CHANNEL
CCW ADDRESS, SEND NO=OP TO C-UT
CHECK FOR NORMAL COMPLETION
• CC NOT EQUAL TO 1
LOAD R10 WITH CAW
OR IN CHANNEL AND DEVICE END

```

000AAC	19 0 A	CR	RO,R10	WAS A DEVICE END AND A CHANNEL
000AAE	47 8 0 C AB6	BC	EQL,CHKCSW	END RECEIVED FROM THE C.U.?
000AB2	99 00 C AB2	HPR		• DEVICE OR CHAN END MISSING
000AB6	58 A 0 D 000	CHKCSW	L R10,0(,R13)	CSW COMMAND CODE AND ADDRESS
000ABA	54 A 0 C 118	N	R10,STSAND	COMMAND CODE IN R10
000ABE	59 A 0 C AF4	C	R10,CSWCMD	CHECK FOR NO=OP COMMAND
000AC2	47 8 0 C C54	BC	EQL,MEMORY	IF COMMAND CODE CORRECT CHECK
000AC6	48 1 0 C 000	LH	R1,0(0,R12)	PICKUP STATUS CODE
000ACA	54 1 0 C C34	N	R1,FOCON	AND=OUT SIGN EXTENSION
000ACE	16 1 0	OR	R1,RO	OR=IN THE COMMAND CODE STORED
000AD0	99 00 1 000	HPR	0(R1)	• DISPLAY STATUS/COMMAND IN ERR
000AD4	99 00 C AD4	ILLEGL		• ILLEGAL CHANNEL
000ADB	99 00 C ADB	ILLINT		• MPX INTERRUPT DURING NO=OP
000ADC	99 00 C ADC	SELINT		• SEL INTERRUPT DURING NO=OP
000AEO	03000E10	SLXCCW	DC X'03000E10'	
000AE4	00000001		DC F'1'	
000AE8	FF000E10		DC X'FF000E10'	
000AEC	00000001		DC F'1'	
000AF0	00000070	SCWMSK	DC X'00000070'	
000AF4	03000000	CSWCMD	DC X'03000000'	
000AF8	0000	HFONES	DC X'0000'	
000AFA	7FFF	HFONEA	DC X'7FFF'	
000AFC	0010	MUXBCW	DC X'0010'	
000AFE	0E10		DC Y(MXBCW1)	
000B00	10010000	ONE001	DC X'10010000'	
000B04	00000000	ZEROS	DC X'00000000'	
000B08	00000004	FOUR	DC X'00000004'	
000B0C	00000000		DC F'00'	
000B10	00000000	TRACK0	DC ZF'0'	SEEK BUFFER / CYL 00 TR 00
	00000000			WRITE COMMAND
000B18	00000001	MSGDMR	DC X'00000001'	
000B1C	38000000 30		DC X'3800000030'	
000B21	000334		DC AL3(LODMAR)	
000B24	0002		DC X'0002'	
000B26	0B28		DC Y(ENDBCW)	
000B28	00C0	ENDBCW	DC X'00C0'	
000B2A	0B2C		DC Y(ENDMMSG)	
000B2C	0D25	ENDMSG	DC X'0D25'	
000B2E	C5D5C440 C4D4D940		DC C'END DMR '	
000B36	0D25		DC X'0D25'	
000B38	00011110	TOT1	DC X'00011110'	PATTERNS FOR ADDER TEST
000B3C	00008000	ZERO8	DC X'00008000'	
000B40	0000FFFF	LOFFFF	DC X'0000FFFF'	LOADER CONSTANT/CCW ADR (CSW)
		LTORG		

000B44	0000EEEE
000B48	00002222
000B4C	0000CCCC
000B50	00004444
000B54	00F0F00F
000B58	00101001
000B5C	01010010
000B60	0F800080
000B64	00800080
000B68	10000100
000B6C	0F008000
000B70	01008000
000B74	0FF80800
000B78	00080800
000B7C	10001000
000B80	0FFF8000
000B84	10000000
000B88	00F8000F
000B8C	00080001
000B90	01000010
000B94	00FF8000
000B98	01000000
000B9C	000F8000
000BA0	00100000
000BA4	22222222
000BA8	6666AAAA
000BAC	44440000
000BB0	4444CCCC
000BB4	88888888
000BB8	77770008
000BBC	11110008
000BC0	88880010
000BC4	EEEEDDDD
000BC8	EEEEEEEE
000BCC	FFFF7FFF
000BD0	FFFFFFFFE
000BD4	33336666
000BD8	11112222
000BDC	44448888
000BE0	0F019998
000BE4	01008888
000BE8	10022220
000BEC	000B80B8
000BFD	000C00C0


```

000BF4 000D80D8
000BF8 000E00E0
000BFC 000E80E8
000C00 000F00F0
000C04 00078078
000C08 00080080
000C0C 0B808800
000C10 0C00C000
000C14 0D80D800
000C18 0E00E000
000C1C 0E80E800
000C20 0F00F000
000C24 07807800
000C28 08008000
000C2C 0F00FF80
000C30 01000080
000C34 000000F0
000C38 F0F0F0F0
000C3C 0F0F0F0F
000C40 FFFFFFFF
000C44 00000000
000C48 00001000
000C4C 00005000
000C50 00000004
000C54 58 1 0 C C48
000C58 58 2 0 C C4C
000C5C 58 3 0 C C38
000C60 58 4 0 C C3C
000C64 58 5 0 C C40
000C68 58 6 0 C C44
000C6C 50 3 0 1 000
000C70 58 7 0 1 000
000C74 19 3 7
000C76 47 8 0 C C7E
000C7A 99 00 7 000
000C7E 50 4 0 1 000
000C82 58 8 0 1 000
000C86 19 4 8
000C88 47 8 0 C C90
000C8C 99 00 8 000
000C90 50 5 0 1 000
000C94 58 9 0 1 000
000C98 19 5 9
000C9A 47 8 0 C CA2

```

```

FOCON DC X'000000F0'
FOS DC X'F0F0F0F0'
OFS DC X'0F0F0F0F'
FFS DC X'FFFFFFF'
OOS DC X'00000000'
BGN DC X'00001000'
FIN DC X'00005000'
ONEFW DC X'00000004'
MEMORY L R1,BGN
L R2,FIN
L R3,FOS
L R4,OFS
L R5,FFS
L R6,OOS
M1 ST R3,0(,R1)
L R7,0(,R1)
CR R3,R7
BC B,M2
HPR O(R7)
M2 ST R4,0(,R1)
L R8,0(,R1)
CR R4,R8
BC B,M3
HPR O(R8)
M3 ST R5,0(,R1)
L R9,0(,R1)
CR R5,R9
BC B,M4

```

```

* * * * *
*
*   S T O R A G E   T E S T   *
*   C O N S T A N T S       *
*
* * * * *
CHECK ADDRESSES 01000-06000
R1 = START / CURRENT...
R2 = ENDING ADDRESS
R3 = R6 ARE PATTERNS...

R7 = R10 CHECK READ...

```

* F0F0F0F0 DIDNT WRITE / READ

* 0F0F0F0F DIDNT WRITE / READ

000C9E	99	00	9	000
000CA2	50	6	0	1 000
000CA6	58	A	0	1 000
000CAA	19	6	A	
000CAC	47	8	0	C CB4
000CB0	99	00	A	000
000CB4	5A	1	0	C C50
000CB8	19	1	2	
000CBA	47	C	0	C C6C
000CBE	47	F	0	C 204

M4

M5

HPR	O(R9)
ST	R6,O(,R1)
L	R10,O(,R1)
CR	R6,R10
BC	8,M5
HPR	O(R10)
A	R1,ONEFW
CR	R1,R2
BC	12,M1
BC	15,SCAN
END	

• FFFFFFFF DIDNT WRITE / READ

• 00000000 DIDNT WRITE / READ

	SDMR	START	4096	
		USING	9,12,13,14,15	BASE REGISTERS FOR PK SEGMENTS:
000001	B1	EQU	1	
000002	B2	EQU	2	
000003	B3	EQU	3	
000004	B4	EQU	4	
000005	B5	EQU	5	
000006	B6	EQU	6	
000007	B7	EQU	7	
000008	B8	EQU	8	
000009	B9	EQU	9	
00000A	B10	EQU	10	
00000B	B11	EQU	11	
00000C	B12	EQU	12	
00000D	B13	EQU	13	
00000E	B14	EQU	14	
00000F	B15	EQU	15	
000000	R0	EQU	0	
000001	R1	EQU	1	
000002	R2	EQU	2	
000003	R3	EQU	3	
000004	R4	EQU	4	
000005	R5	EQU	5	
000006	R6	EQU	6	
000007	R7	EQU	7	
000008	R8	EQU	8	
000009	R9	EQU	9	
00000A	R10	EQU	10	
00000B	R11	EQU	11	
00000C	R12	EQU	12	
00000D	R13	EQU	13	
00000E	R14	EQU	14	
00000F	R15	EQU	15	
000000	S0ABS	EQU	0	
000010	S1ABS	EQU	16	
000020	S2ABS	EQU	32	
000030	S3ABS	EQU	48	
000040	S4ABS	EQU	64	
000050	S5ABS	EQU	80	
000060	S6ABS	EQU	96	
000070	S7ABS	EQU	112	
000080	S8ABS	EQU	128	
000090	S9ABS	EQU	144	
0000A0	S10ABS	EQU	160	

000080	S11ABS	EQU	176
0000C0	S12ABS	EQU	192
0000D0	S13ABS	EQU	208
0000E0	S14ABS	EQU	224
0000F0	S15ABS	EQU	240
.....			
000008	OSVPSW	EQU	X'008'
000018	OPRPSW	EQU	X'018'
000028	OTMPSW	EQU	X'028'
000038	OMSPSW	EQU	X'038'
000048	OMNPSW	EQU	X'048'
000058	OS1PSW	EQU	X'058'
000068	OS2PSW	EQU	X'068'
000078	ONUPSW	EQU	X'078'
000088	NSVPSW	EQU	X'088'
000098	NPRPSW	EQU	X'098'
0000A8	NTMPSW	EQU	X'0A8'
0000B8	NMSPSW	EQU	X'0B8'
0000C8	NMNPSW	EQU	X'0C8'
0000D8	NS1PSW	EQU	X'0D8'
0000E8	NS2PSW	EQU	X'0E8'
000114	IPLBCW	EQU	X'114'
000190	TCW	EQU	X'190'
0001A0	CSW1	EQU	X'1A0'
0001A8	CSW2	EQU	X'1A8'
.....			
000008	ZERO	EQU	8
000007	NONZ	EQU	7
000004	LSZ	EQU	4
00000C	LEZ	EQU	12
000002	GTZ	EQU	2
00000A	GEZ	EQU	10
000008	EQL	EQU	8
000007	NEQ	EQU	7
00000F	UNCOND	EQU	15
000004	MIXED	EQU	4
000001	ONES	EQU	1
00000E	NONES	EQU	14
000001	OVFLOW	EQU	1
000002	OPIHI	EQU	2
000004	OPILO	EQU	4
0000C4	P12ABS	EQU	196
0000F4	P15ABS	EQU	244
.....			

000000	SRSS	EQU	0	SUPERVISOR REGISTERS AND STATE
000001	SRPS	EQU	1	SUPERVISOR REG., PROBLEM STATE
000002	PRSS	EQU	2	PROBLEM REG., SUPERVISOR STATE
000003	PRPS	EQU	3	PROBLEM REG., PROBLEM STATE
000214	EXIT	EQU	532	LOADER EXIT ADDRESS FOR END/DHR
* * * * *				
001000	18 C 5	LR	R12,R5	LOAD BASE REGISTER
001002	58 0 0 0 000	L	R13,S12ABS(,0)	LOAD SUPERVISOR REGISTERS 13,
001006	18 E D	LR	R14,R13	14 AND 15 WITH HEX 1000
001008	18 F D	LR	R15,R13	
00100A	1A D D	AR	R13,R13	LOAD R13 WITH 2000
00100C	1A E D	AR	R14,R13	LOAD R14 WITH 3000
00100E	1A F E	AR	R15,R14	LOAD R15 WITH 4000
001010	18 8 8	SR	R8,R8	LOAD REGISTERS USED IN DHR
001012	58 7 0 0 308	L	R7,CONONE	
001016	41 6 0 0 003	LA	R6,3(,0)	
00101A	46 7 0 C 022	BCT1	R7,BCT1A	BEGIN CHECKING BCT INSTRUCTION
00101E	47 F 0 C 030	BC	UNCOND,BCT2	
001022	58 A 0 D 284	BCT1A	R10,BCTAD1	
001026	06 7 A	BCTR	R7,R10	BCT DIDN'T MAKE BRANCH ON ZERO
001028	99 00 C 028	HPR		• BCT & BCTR BOTH DON'T BRANCH
00102C	99 00 C 02C	HPR		• ONLY BCT FAILS, BCTR OK
001030	18 4 8	BCTER1		CLEAR R4
001032	5A 4 0 D 308	BCT2	R4,R8	ADD ONE TO R4
001036	46 6 0 C 032	BCT2A	R4,CONONE	CONTINUE CHECKING
00103A	59 4 0 D 304	BCT	R6,BCT2A	WAS BRANCH MADE TO BCT2A?
00103E	47 8 0 C 046	BCT3	R4,CONTHR	R4 SHOULD EQUAL THREE
001042	99 00 C 042	BC	ZERO,BCTR1	• DIDN'T DO BRANCH TO ADD INST
001046	58 A 0 D 288	HPR		
00104A	58 7 0 D 308	BCTR1	R10,BCTAD2	
00104E	06 7 A	L	R7,CONONE	CHECK BRANCH ON ZERO IN BCTR
001050	18 4 8	BCTR	R7,R10	CLEAR R4
001052	41 3 0 0 003	LR	R4,R8	
001056	5A 4 0 D 308	LA	R3,3(,0)	ADD ONE TO R4
00105A	58 A 0 D 28C	BCTR2A	R4,CONONE	
00105E	06 3 A	L	R10,BCTAD3	
001060	59 4 0 D 304	BCTR	R3,R10	CONTINUE CHECK
001064	47 8 0 C 070	BCTR3	R4,CONTHR	WAS BRANCH MADE TO BCTR2A?
001068	99 00 C 068	C	ZERO,CH1	NEXT CHECK DECIMAL INSTRUCTIONS
00106C	99 00 C 06C	BC		• BCTR DIDN'T DO BRANCH TO ADD
001070	18 4 8	HPR		• BCTR DIDN'T MAKE BRANCH ON ZERO
001072	49 4 0 D 2EC	HPR		SET R4 TO ZEROS
001076	47 8 0 C 09E	BCTR2	R4,R8	BEGIN TESTING CH INSTRUCTION
00107A	58 4 0 D 320	CH1	R4,ZEROS	CONTINUE WITH PROGRAM
		CH	R4,ZEROS	SET R4 TO COMPARE ONES
		BC	ZERO,CH2	
		L	R4,HFONES	

```

00107E 49 4 0 D 320
001082 47 8 0 C 09A
001086 58 4 0 D 2F0
00108A 49 4 0 D 324
00108E 47 8 0 C 096
001092 99 00 C 092
001096 99 00 C 096
00109A 99 00 C 09A
00109E 58 4 0 D 320
0010A2 49 4 0 D 322
0010A6 47 8 0 C 0AE
0010AA 99 00 C 0AA
0010AE 58 4 0 D 2F0
0010B2 49 4 0 D 2F0
0010B6 47 8 0 C 0BE
0010BA 99 00 C 0BA
0010BE 58 4 0 D 33C
0010C2 40 4 0 D 32C
0010C6 58 4 0 D 33C
0010CA 49 4 0 D 32C
0010CE 47 8 0 C 0D6
0010D2 99 00 C 0D2
0010D6 41 4 0 D 1E8
0010DA 41 5 0 D 1EC
0010DE 41 6 0 D 1E4
0010E2 58 7 0 D 268
0010E6 41 8 0 C 118
0010EA 58 9 0 D 2C8
0010EE 41 A 0 C 1AE
0010F2 50 4 0 D 0DC
0010F6 50 5 0 D 0EC
0010FA 50 6 0 D 0BC
0010FE 50 7 0 D 088
001102 50 8 0 D 08C
001106 50 9 0 D 098
00110A 50 A 0 D 09C
00110E 0A 0F
001110 58 A 0 D 008
001114 99 00 A 000
001118 58 A 0 D 00C
00111C 54 A 0 D 21C
001120 41 9 0 C 110
001124 19 9 A
001126 47 8 0 C 12E

```

SERR
CHERR1
CH2

CH3

STH1

SVCALL

SVCAL

SVCAL1

CH
BC
L
CH
BC
HPR
HPR
HPR
L
CH
BC
HPR
L
CH
BC
HPR
L
STH
L
CH
BC
HPR
LA
LA
LA
L
LA
L
LA
ST
ST
ST
ST
ST
ST
ST
SVC
L
HPR
L
N
LA
CR
BC

R4,HFONES
ZERO,CHERR1
R4,MINUS1
R4,SXONES
ZERO,SERR

R4,HFONES
R4,HFONEA
ZERO,CH3

R4,MINUS1
R4,MINUS1
ZERO,STH1

R4,WPCON
R4,EXTRA
R4,WPCON
R4,EXTRA
ZERO,SVCALL

R4,SEL1IN
R5,SEL2IN
R6,MUXIN
R7,X7E
R8,SVCAL1
R9,AICON3
R10,PISVC
R4,NS1PSW+4(,0)
R5,NS2PSW+4(,0)
R6,NSBPSW+4(,0)
R7,NSVPSW(,0)
R8,NSVPSW+4(,0)
R9,NRPSPW(,0)
R10,NRPSPW+4(,0)
IS
R10,OSVPSW(,0)
D(R10)
R10,OSVPSW+4(,0)
R10,ADMASK
R9,SVCAL
R9,R10
EQL,SVCAL2

COMPARE ONES, NO SIGN EXTENSION

CHECK SIGN EXTENSION

- INSTRUCTION DOESN'T WORK
- CONSTANT SIGN EXTENSION ERROR
- ONES COMPARE, ZEROS DON'T SET R4 TO COMPARE ONES

- ZEROS COMPARE, ONES DON'T CHECK SIGN EXTENSION

COMPARE HALF INSTRUCTION WORKS

- SIGN EXTENSION DOESN'T WORK
- STH SEQUENCES ALREADY CHECKED ONLY HALF OF PATTERN STORED
- CLEAR UPPER HALF OF R4

STORE HALFWORD CHECKED

- STH INSTRUCTION ERROR
- LOAD NEW PSW'S FOR: SELECTOR 1
- SELECTOR 2
- HPX CHANNEL
- SYSTEMS MASK (SYC)
- SUPERVISOR CALL
- SYSTEMS MASK (PROGRAM)
- PROGRAM INTERRUPT
- STORE NEW PSW'S FOR: SELECTOR 1
- SELECTOR 2
- HPX CHANNEL
- SYSTEMS MASK (SYC)
- SUPERVISOR CALL
- SYSTEMS MASK (PROGRAM)
- PROGRAM INTERRUPTS

EXECUTE SUPERVISOR CALL
NO INTERRUPT OCCURRED

- NO SUPERVISOR CALL INTERRUPT
- CHECK OLD SUPERVISOR PSW FOR THE INSTRUCTION ADDRESS
- LOAD R9 WITH THE CORRECT ADDR
- WAS CORRECT ADDRESS STORED IN THE OLD PSW?

```

00112A 99 00 A 000
00112E 58 A 0 0 008
001132 54 A 0 0 210
001136 41 9 0 0 00F
00113A 19 9 A
00113C 47 8 0 C 144
001140 99 00 A 000
001144 58 A 0 0 008
001148 54 A 0 0 218
00114C 47 8 0 C 154
001150 99 00 A 000
001154 58 9 0 0 2EC
001158 41 A 0 C 16A
00115C 50 9 0 0 088
001160 50 A 0 0 08C
001164 0A F0
001166 99 00 C 166
00116A 58 A 0 0 008
00116E 54 A 0 0 210
001172 41 9 0 0 0F0
001176 19 9 A
001178 47 8 0 C 180
00117C 99 00 A 000
001180 58 A 0 0 008
001184 54 A 0 0 234
001188 59 A 0 0 268
00118C 47 8 0 C 194
001190 99 00 C 190
001194 41 9 0 C 19E
001198 50 9 0 0 08C
00119C 0A 00
00119E 58 A 0 0 008
0011A2 54 A 0 0 234
0011A6 47 8 0 C 1B2
0011AA 99 00 C 1AA
0011AE 99 00 C 1AE
0011B2 41 A 0 C 26A
0011B6 50 A 0 0 09C
0011BA 41 A 0 C 1D0
0011BE 50 A 0 0 08C
0011C2 58 A 0 0 268
0011C6 50 A 0 0 088
0011CA 80 00 0 268
0011CE 0A 00

```

```

SVCAL2 HPR 0(R10)
L R10,OSVPSW(,0)
N R10,INCMASK
LA R9,15(,0)
CR R9,R10
BC EQL,SVCAL3
HPR 0(R10)
SVCAL3 L R10,OSVPSW(,0)
N R10,INMSKU
BC ZERO,SVCAL4
HPR 0(R10)
SVCAL4 L R9,ZEROS
LA R10,SVCAL5
ST R9,NSVPSW(,0)
ST R10,NSVPSW+4(,0)
SVC 240
HPR
SVCAL5 L R10,OSVPSW(,0)
N R10,INCMASK
LA R9,240(,0)
CR R9,R10
BC EQL,SVCAL6
HPR 0(R10)
SVCAL6 L R10,OSVPSW(,0)
N R10,FE
C R10,X7E
BC EQL,SVCAL7
HPR
SVCAL7 LA R9,SVCAL8
ST R9,NSVPSW+4(,0)
SVC 0
SVCAL8 L R10,OSVPSW(,0)
N R10,FE
BC ZERO,SETMSK
HPR
PISVC SETMSK LA R10,SSHINT
ST R10,NPRPSW+4(,0)
LA R10,STMSK1
ST R10,NSVPSW+4(,0)
L R10,X7E
ST R10,NSVPSW(,0)
SSH X7E
SVC 0

```

- NO, ADDR INCORRECT IN AD
CHECK OLD SUPERVISOR PSW FOR
THE INTERRUPT CODE
LOAD R9 WITH F
WAS THE INTERRUPT CODE STORED
CORRECTLY IN THE OLD PSW?
- NO, INT. CODE INCORRECT IN AD
CHECK OLD SUPERVISOR PSW FOR
INTERRUPT CODE (16-23)
WERE ALL BITS ZERO?
- NO, DISPLAY INCORRECT IN AD
SET UP NEW SUPERVISOR
PSW TO CHECK SYSTEMS MASK
WHICH SHOULD EQUAL ONES

STORE CURRENT SYSTEMS MASK IN
- OLD PSW, NO INTERRUPT OCCURED
CHECK INTERRUPT CODE OF OLD
SUPERVISOR PSW SHOULD = F0
LOAD R9 WITH F0
WAS INTERRUPT CODE STORED
CORRECTLY IN THE OLD PSW?
- NO DISPLAY INCORRECT IN AD
LOAD OLD SUPERVISOR PSW
CLEAR ALL BUT SYSTEMS MASK
ARE BITS 1 THRU 6 SET?
EITHER BIT 0 IS SET OR A
BIT BETWEEN 1 & 6 DID NOT SET
- BIT BETWEEN 1 & 6 DID NOT SET
LOAD NEW SUPERVISOR PSW
TO CHECK SYSTEMS MASK OF ZERO?
STORE MASK IN OLD PSW
LOAD OLD SUPERVISOR PSW
CLEAR ALL BUT SYSTEMS MASK
WERE ANY BITS BETWEEN 1 AND
- SET?
- UNEXPECTED PROGRAM INTERRUPT
LOAD NEW PROGRAM PSW
INTERRUPT ADDRESS
LOAD NEW SUPERVISOR PSW
INTERRUPT ADDRESS
CHANGE NEW SUPERVISOR PSW
SYSTEMS MASK TO ALL ONES
SET SYSTEMS MASK BITS 1-6
SWAP PSW TO CHECK SYSTEM MASK

```

001100 58 A 0 0 008
001104 54 A 0 0 234
001108 59 A 0 0 268
00110C 47 8 0 C 202
0011E0 41 A 0 C 1EA
0011E4 50 A 0 0 08C
0011E8 0A 00
0011EA 58 A 0 0 008
0011EE 54 A 0 0 234
0011F2 59 A 0 0 268
0011F6 47 8 0 C 1FE
0011FA 99 00 C 1FA
0011FE 99 00 C 1FE
001202 58 9 0 0 2C8
001206 41 A 0 C 218
00120A 50 9 0 0 088
00120E 50 A 0 0 08C
001212 80 00 0 270
001216 0A 00
001218 58 A 0 0 008
00121C 54 A 0 0 234
001220 59 A 0 0 270
001224 47 8 0 C 22C
001228 99 00 C 228
00122C 41 A 0 C 240
001230 50 A 0 0 08C
001234 18 A A
001236 50 A 0 0 088
00123A 80 00 0 210
00123E 0A 00
001240 58 A 0 0 008
001244 54 A 0 0 234
001248 47 8 0 C 270
00124C 41 A 0 C 256
001250 50 A 0 0 08C
001254 0A 00
001256 58 A 0 0 008
00125A 54 A 0 0 234
00125E 47 8 0 C 266
001262 99 00 C 262
001266 99 00 C 266
00126A 99 00 C 26A
00126E 0700
001270 80 00 0 2C8

```

```

STMSK1 L R10,0SVPSW(,0)
N R10,FE
C R10,X7E
BC EQL,STMSK3
LA R10,SSMER2
ST R10,NSVPSW+4(,0)
SVC 0
SSMER2 L R10,0SVPSW(,0)
N R10,FE
C R10,X7E
BC EQL,SSMER3
HPR
SSMER3 HPR
STMSK3 L R9,AICON3
LA R10,STMSK4
ST R9,NSVPSW(,0)
ST R10,NSVPSW+4(,0)
SSM X80
SVC 0
STMSK4 L R10,0SVPSW(,0)
N R10,FE
C R10,X80
BC EQL,STMSK5
HPR
STMSK5 LA R10,STMSK6
ST R10,NSVPSW+4(,0)
SR R10,R10
ST R10,NSVPSW(,0)
SSM INCHSK
SVC 0
STMSK6 L R10,0SVPSW(,0)
N R10,FE
BC ZERO,PROGRM
LA R10,SSMER
ST R10,NSVPSW+4(,0)
SVC 0
SSMER L R10,0SVPSW(,0)
N R10,FE
BC ZERO,SSMER1
HPR
SSMER1 HPR
SSMINT HPR
CNOP
PROGRM SSM 0,4
AICON3

```

```

LOAD R10 WITH OLD SUPERVISOR
PSW AND CHECK MASK
ARE BITS 1-6 ONES?
IF ALL MASK BITS 1'S, CHK BIT 0
NO, RECHECK FOR MASK OF ONES
WITH ANOTHER SUPERVISOR CALL
STORE MASK IN OLD PSW
LOAD R10 WITH SYSTEMS MASK
CLEAR ALL BUT SYSTEMS MASK
IS THE SYSTEMS MASK NOW ONES?
IF EQUAL SVC SET ALL BITS
• PSW IF WILL NOT SET
• SSM INSTRUCTION ERROR
SET UP NEW SUPERVISOR PSW
SYSTEMS MASK AND ADDRESS
STORE SYSTEMS MASK (0200000)
STORE ADDRESS (STMSK5)
SET BIT 0 OF PSW
SWAP PSW'S TO CHECK MASK
LOAD R10 WITH OLD PSW
OBTAIN ONLY SYSTEMS MASK
IS ONLY BIT 0 SET?
CHECK FOR BEING EQUAL
• NO, BIT 0 NOT SET
LOAD NEW SUPERVISOR PSW
INTERRUPT ADDRESS
CLEAR R10 AND STORE
IN SYSTEMS MASK AND INT. CODE
CLEAR SYSTEMS MASK
SWAP PSW TO CHECK SYSTEMS MASK
CHECK SYSTEMS MASK OF OLD
SUPERVISOR PSW
WAS SYSTEMS MASK ZERO?
NO, RECHECK FOR MASK OF ZERO
WITH ANOTHER SUPERVISOR CALL
STORE MASK IN OLD PSW
LOAD R10 WITH SYSTEMS MASK
CLEAR ALL BUT SYSTEMS MASK
IS THE SYSTEMS MASK NOW ZERO?
• NO, PSW FF WILL NOT CLEAR
• YES, SSM INSTRUCTION ERROR
• UNEXPECTED PROGRAM INTERRUPT
ALIGN ON FULL WORD BOUNDARY
SET PSW BIT, PROGRAM INT.

```


001274	41 A 0 C 2BC	LA	R10,PRGRM1	LOAD NEW PROGRAM PSW
001278	50 A 0 0 09C	ST	R10,NPRPSW+4(,0)	INTERRUPT ADDRESS
00127C	41 8 0 0 005	LA	R8,5(,0)	INDEX REGISTER FOR BCT
001280	58 7 0 D 2EC	L	R7,ZEROS	INDEX REGISTER FOR ILLEGAL INST
001284	58 9 7 D 1F0	PRGRM	R9,ILLINST(R7)	LOAD R9 WITH ILLEGAL INSTR.
001288	50 9 0 C 28C	ST	R9,XQTILL	STORE AT NEXT ADDRESS
00128C	00000000	XQTILL	F'0'	EXECUTE ILLEGAL INSTRUCTION
001290	47 F 7 C 294	BC	UNCOND,NOINTR(R7)	NO INTERRUPT OCCURED
001294	47 F 0 C 2A8	NOINTR	UNCOND,TRYSE	NO INTERRUPT WITH 0'S
001298	99 00 C 298	HPR		• NO INTERRUPT WITH 2
00129C	99 00 C 29C	HPR		• NO INTERRUPT WITH A
0012A0	99 00 C 2A0	HPR		• NO INTERRUPT WITH C
0012A4	99 00 C 2A4	HPR		• NO INTERRUPT WITH OF
0012A8	41 A 0 C 2B8	TRYSE	R10,TRYSE1	NO ILLEGAL INSTRUCTION INTERRUPT, TRY SPECIFICATION INT.
0012AC	50 A 0 0 09C	ST	R10,NPRPSW+4(,0)	SHOULD GENERATE SPECIFICATION
0012B0	59 A 0 D 331	C	R10,ODDBYT	• INTERRUPT, DID NOT OCCUR
0012B4	99 00 C 2B4	HPR		• SPECIFICATION INT. BUT NO PROG.
0012B8	99 00 C 2B8	HPR		CHECK OLD PROGRAM PSW FOR
0012BC	58 A 0 0 018	PRGRM1	R10,OPRPSW(,0)	CORRECT INTERRUPT CODE
0012C0	54 A 0 D 324	N	R10,SXONES	IS IT EQUAL TO 10?
0012C4	59 A 0 D 26C	C	R10,TEN10	CHECK FOR INTERRUPT CODE OF 10
0012C8	47 8 0 C 2D0	BC	EQL,PRGRM2	• INTERRUPT CODE INCORRECT
0012CC	99 00 A 000	HPR	0(R10)	INCREMENT R7 BY 4
0012D0	41 7 0 7 004	PRGRM2	R7,4(,R7)	BRANCH TO EXECUTE NEXT ILL INST
0012D4	46 8 0 C 284	BCT	R8,PRGRM	LOAD NEW PROGRAM PSW WITH
0012D8	41 A 0 C 2E8	LA	R10,PRGRM3	INTERRUPT ADDRESS
0012DC	50 A 0 0 09C	ST	R10,NPRPSW+4(,0)	GENERATE SPECIFICATION INT.
0012E0	59 A 0 D 331	C	R10,ODDBYT	• NO SPECIFICATION INTERRUPT
0012E4	99 00 C 2E4	HPR		CHECK OLD PROGRAM PSW FOR
0012E8	58 A 0 0 018	PRGRM3	R10,OPRPSW(,0)	INTERRUPT CODE
0012EC	54 A 0 D 324	N	R10,SXONES	IS INTERRUPT CODE 60?
0012F0	59 A 0 D 20C	C	R10,SIXTY	
0012F4	47 8 0 C 2FC	BC	EQL,LPSW	• INCORRECT INTERRUPT CODE
0012F8	99 00 A 000	HPR	0(R10)	SET UP NEW SUPERVISOR PSW AND
0012FC	58 8 0 D 2C8	LPSW	R8,AICON3	ENABLE ONLY PROGRAM INTERRUPTS
001300	41 9 0 C 31E	LA	R9,LPSW2	AND SET INTERRUPT ADDR FOR PGH.
001304	41 A 0 C 3AE	LA	R10,LPSW1	STORE IN SYSTEMS MASK (SVC)
001308	50 8 0 0 088	ST	R8,NSVPSW(,0)	LOCATION AND ADDRESS OF SVC PSW
00130C	50 9 0 0 08C	ST	R9,NSVPSW+4(,0)	STORE IN ADDRESS PORTION OF PSW
001310	50 A 0 0 09C	ST	R10,NPRPSW+4(,0)	LOAD PSW WITH ZEROS AND LPSW1
001314	82 00 D 238	LPSW	NEWPSW	• CURRENT PSW REMAINED UNCHANGED
001318	99 00 C 318	HPR		SWAP PSW'S TO CHECK LOAD PSW
00131C	0A 00	LPSW1	0	CHECK SYSTEMS MASK FOR BEING
00131E	58 A 0 0 008	LPSW2	R10,OSVPSW(,0)	

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001322 54 A 0 D 240
001326 47 8 0 C 32E
00132A 99 00 A 000
00132E 58 A 0 D 00C
001332 54 A 0 D 258
001336 47 8 0 C 33E
00133A 99 00 A 000
00133E 41 A 0 C 350
001342 50 A 0 D 08C
001346 82 00 D 240
00134A 99 00 C 34A
00134E 0A 00
001350 58 A 0 D 008
001354 54 A 0 D 240
001358 59 A 0 D 240
00135C 47 8 0 C 364
001360 99 00 C 360
001364 58 A 0 D 00C
001368 54 A 0 D 258
00136C 59 A 0 D 258
001370 47 8 0 C 378
001374 99 00 C 374
001378 58 9 0 D 25C
00137C 41 A 0 C 392
001380 50 9 0 D 088
001384 50 A 0 D 08C
001388 41 A 0 C 39A
00138C 50 A 0 D 09C
001390 0A 00
001392 82 00 D 248
001396 99 00 C 396
00139A 58 A 0 D 018
00139E 54 A 0 D 210
0013A2 59 A 0 D 204
0013A6 47 8 0 C 382
0013AA 99 00 A 000
0013AE 99 00 C 3AE
0013B2 41 8 0 C 49E
0013B6 58 9 0 D 2C8
0013BA 41 A 0 C 3FA
0013BE 50 8 0 D 09C
0013C2 50 9 0 D 098
0013C6 50 9 0 D 088
0013CA 50 A 0 D 08C

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LPSW3

LPSW4

LPSW5

LPSW6

LPSW7

LPSW8

LPSW9

LPSW10

LPSW11

LPSWPI

LDPSWS

```

N
BC
HPR
L
N
BC
HPR
LA
ST
LPSW
HPR
SVC
L
N
C
BC
HPR
L
N
C
BC
HPR
L
LA
ST
ST
LA
ST
SVC
LPSW
HPR
L
N
C
BC
HPR
HPR
LA
L
LA
ST
ST
ST
ST
R10,UPPSW
ZERO,LPSW3
O(R10)
R10,OSVPSW+4(,0)
R10,LWPSW
ZERO,LPSW4
O(R10)
R10,LPSW6
R10,NSVPSW+4(,0)
UPPSW

O
R10,OSVPSW(,0)
R10,UPPSW
R10,UPPSW
EQL,LPSW7

R10,OSVPSW+4(,0)
R10,LWPSW
R10,LWPSW
EQL,LPSW8

R9,PISRPS
R10,LPSW9
R9,NSVPSW(,0)
R10,NSVPSW+4(,0)
R10,LPSW11
R10,NPRPSW+4(,0)
O
NWPSW

R10,OPRPSW(,0)
R10,INCHSK
R10,TWENTY
EQL,LDPSWS
O(R10)

R8,THINT
R9,AICON3
R10,CSARS
R8,NPRPSW+4(,0)
R9,NPRPSW(,0)
R9,NSVPSW(,0)
R10,NSVPSW+4(,0)

```

CLEARED; OBTAIN SYSTEMS MASK
IS MASK ALL ZEROS?

- A BIT REMAINED SET IN THE PSW
CHECK PROGRAM MASK, WHICH
SHOULD ALSO EQUAL ZERO
ZERO, THEN CHECK BOTH FOR ONES
- A PROGRAM MASK BIT EQUATED ONE
LOAD NEW SUPERVISOR PSW
ADDRESS FOR NEXT SVC
LOAD PSW WITH ONES AND LPSW5
- PSW WAS NOT UPDATED WITH LPSW
STORE PSW TO CHECK BOTH MASKS
CHECK SYSTEMS MASK, WHICH
SHOULD BE EQUAL TO ONES
ARE ALL SELECTED BITS ONE
IF ALL ARE ONES, CHK. PROGRAM
MASK, IF NOT STOP
- CHECK PROGRAM MASK FOR ONES
OBTAIN PROGRAM MASK FROM PSW
COMPARE AGAINST ALL ONES
IS PROGRAM MASK ONES?
- NO, A BIT WAS NOT SET
SET UP NEW SUPERVISOR PSW TO
GO INTO PROBLEM STATE TO
CHECK PRIVILEGED OPERATION
EXCEPTION WITH A LPSW INST.
SET NEW PROGRAM INTERRUPT
RETURN ADDRESS
GO TO PROBLEM STATE
EXECUTE PRIVILEGED INSTRUCTION
- NO INTERRUPT GENERATED
LOAD OLD PROGRAM PSW
CLEAR ALL BUT INTERRUPT CODE
THE INTERRUPT CODE SHOULD BE
EQUAL TO 20 FOR A PRIVILEGED
OPERATION EXCEPTION
- INCORRECT PROGRAM INTERRUPT
LOAD R8 WITH ADDR PROGRAM INT
LOAD R9 WITH SYSTEMS MASK
LOAD R10 WITH ADDR SVC ROUTINE
STORE ADDRESS FOR PROGRAM INT
STORE SYSTEMS MASK IN NEW SVC
AND PROGRAM PSW'S
STORE ADDRESS OF SVC ROUTINE

0013CE	0A 02		SVC	PRSS	PROBLEM REGS, SUPERVISOR STATE
0013D0	58 C 0 0 0C0		L	R12,S12ABS(,0)	LOAD PROBLEM REGISTERS 12
0013D4	58 D 0 0 0D0		L	R13,S13ABS(,0)	THROUGH 15 WITH CORRESPONDING
0013D8	58 E 0 0 0E0		L	R14,S14ABS(,0)	SUPERVISOR REGISTERS 12
0013DC	58 F 0 0 0F0		L	R15,S15ABS(,0)	THROUGH 15
0013E0	0A 00		SVC	SRSS	RETURN TO SUPERVISOR REGISTERS
0013E2	59 C 0 0 0C4		C	R12,P12ABS(,0)	COMPARE SUPV & PROB RGS 12
0013E6	47 8 0 C 3EE		BC	EQL,PROB15	IF R10 = R12 CHECK REGISTER 15
0013EA	99 00 C 3EA		HPR		• PROB REG 12 DIDN'T = SUPV 12
0013EE	59 F 0 0 0F4	PROB15	C	R15,P15ABS(,0)	COMPARE SUPV & PROB RGS 12
0013F2	47 8 0 C 42E		BC	EQL,TH	R10 SHOULD EQUAL R15
0013F6	99 00 C 3F6		HPR		• PROB REG 15 DIDN'T = SUPV 15
0013FA	40 1 0 0 09E	CSARS	STH	R1,NPRPSW+6(,0)	STORE RETURN ADDR, PROGRAM INT.
0013FE	58 1 0 0 008		L	R1,OSVPSW(,0)	INTERRUPT CODE OF OLD SUPER-
001402	54 1 0 0 210		N	R1,INCMSK	VISOR PSW CONTAINS STATE & REG.
001406	56 1 0 0 260		O	R1,HEX200	OR IN PROGRAM INTERRUPT ENABLE
00140A	40 1 0 0 250		STH	R1,SVCPSW	STORE SYSTEMS MASK FOR NEW PSW
00140E	54 1 0 0 264		N	R1,HEX202	CLEAR PROBLEM STATE BIT, IF SET
001412	40 1 0 0 088		STH	R1,NSVPSW(,0)	STORE SYSTEMS MASK FOR NSVPSW
001416	58 1 0 0 00C		L	R1,OSVPSW+4(,0)	SET UP ADDRESS TO RETURN TO
00141A	54 1 0 0 21C		N	R1,ADMASK	PROGRAM WITH PROPER REGISTERS
00141E	40 1 0 0 256		STH	R1,SVCPSW+6	AND IN THE PROPER STATE
001422	58 1 0 0 09C		L	R1,NPRPSW+4(,0)	RESTORE R1 TO INCOMING VALUE
001426	82 00 D 250		LPSW	SVCPSW	LOAD PSW TO RETURN TO PROGRAM
00142A	99 00 C 42A		HPR		• LPSW FAILED TO TRANSFER CONTROL
00142E	91 FF D 2F0	TH	TH	MINUS1,X'FF'	TEST UNDER MASK ALL SELECTED
001432	47 1 0 C 446		BC	ONES,TH1	BITS SHOULD BE ONES
001436	91 FF D 210		TH	INCMSK,X'FF'	NOT ALL ONES, CHECK FOR ALL
00143A	47 8 0 C 442		BC	ZERO,THERR1	SELECTED BITS ZERO
00143E	99 00 C 43E		HPR		• NEITHER ONES OR ZEROS TEST
001442	99 00 C 442	THERR1	HPR		• ZEROS WORK AND ONES DON'T
001446	91 FF D 210	TH1	TH	INCMSK,X'FF'	TEST ALL BITS ZERO
00144A	47 8 0 C 452		BC	ZERO,TH2	
00144E	99 00 C 44E		HPR		• NOT ALL SELECTED BITS ARE ZERO
001452	91 FF D 274	TH2	TH	TMSK5A,X'FF'	TEST UNDER MASK CONSTANT 5A
001456	47 4 0 C 45E		BC	MIXED,TH3	ARE SELECTED BITS MIXED?
00145A	99 00 C 45A		HPR		• NO, CC NOT SET CORRECTLY
00145E	91 FF D 275	TH3	TH	TMSK5A,X'FF'	TEST UNDER MASK CONSTANT 5A
001462	47 4 0 C 46A		BC	MIXED,TH4	ARE SELECTED BITS MIXED?
001466	99 00 C 466		HPR		• NO, CC NOT SET CORRECTLY
00146A	91 00 D 275	TH4	TH	TMSK5A,X'00'	TEST UNDER MASK WITH MASK ZERO
00146E	47 8 0 C 476		BC	ZERO,TH5	IS CC SET CORRECTLY?
001472	99 00 C 472		HPR		• NO, MASK NOT INTERPRETED AS 0
001476	41 1 0 C 48A	TH5	LA	R1,TH6	LOAD R1 WITH PROGRAM INT RETURN

00147A	0A 03		SVC	PRPS	ADDRESS AND ENTER PROBLEM STATE
00147C	91 FF 0 0A0		TM	SIOABS(RO),X'FF'	REFERENCE LOW ORDER STORAGE
001480	41 1 0 C 49E		LA	R1,THINT	LOAD PROGRAM INT ADDRESS
001484	0A 00		SVC	SRSS	RETURN TO SUPERVISOR STATE
001486	99 00 C 486		HPR		• NO ADDRESSING EXCEPTION INT.
00148A	58 A 0 0 018	TM6	L	R10,OPRPSW(,0)	LOAD OLD PROGRAM PSW
00148E	54 A 0 D 210		N	R10,INCHSK	CLEAR ALL BUT INTERRUPT CODE
001492	59 A 0 D 208		C	R10,FIFTY	THE INTERRUPT CODE SHOULD BE
001496	47 8 0 C 4A2		BC	EQL,OVFLW	EQUAL TO 50 FOR ADDRESSING
00149A	99 00 A 000		HPR	0(R10)	• EXCEPTION, IF NOT STOP
00149E	99 00 C 49E	THINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
0014A2	58 9 0 D 214	OVFLW	L	R9,COO	SET UP NEW PSW'S TO ENABLE
0014A6	40 9 0 D 254		STH	R9,SVCPSW+4	BINARY AND DECIMAL OVERFLOW
0014AA	40 9 0 0 09C		STH	R9,NPRPSW+4(,0)	INTERRUPTS
0014AE	40 9 0 0 08C		STH	R9,NSVPSW+4(,0)	
0014B2	18 8 8		SR	R8,R8	LOAD REGISTERS USED IN DMR
0014B4	18 7 8		LR	R7,R8	
0014B6	58 5 0 D 2F0		L	R5,MINUS1	
0014BA	41 1 0 C 52E	BAL1	LA	R1,BALINT	
0014BE	0A 00		SVC	SRSS	
0014C0	58 3 0 D 278		L	R3,ERRADI	SET R3 TO ERROR ADDRESS
0014C4	18 4 8		LR	R4,R8	SET R4 TO ZERO
0014C6	58 9 0 D 224		L	R9,THREED	LOAD R9 WITH PROGRAM MASK
0014CA	04 9 0		SPH	R9	SET CC EQUAL TO THREE
0014CC	45 3 0 C 4DC		BAL	R3,BALSUB	DO SUBROUTINE TESTING BAL
0014D0	59 4 0 D 2F0		C	R4,MINUS1	CHECK IF BRANCH WAS MADE
0014D4	47 8 0 C 4E8		BC	ZERO,BAL2	IF R4 EQUALS ZERO, NO BRANCH
0014D8	99 00 C 4D8		HPR		• ERROR, BRANCH NOT MADE
0014DC	18 4 5	BALSUB	LR	R4,R5	SET R4 TO ONES
0014DE	07 F 3		BCR	15,R3	BRANCH TO ADR IN R3 (UNCOND)
0014E0	99 00 C 4E0		HPR		• BAL SET R3 TO ZERO
0014E4	99 00 C 4E4	BALER1	HPR		• RETURN ADDRESS NOT STORED
0014E8	18 9 3	BAL2	LR	R9,R3	LOAD R9 WITH LINK INFORMATION
0014EA	54 9 0 D 228		N	R9,THREEF	CLEAR ALL BUT PROGRAM MASK
0014EE	59 9 0 D 224		C	R9,THREED	IS IT EQUAL TO TWO?
0014F2	47 8 0 C 4FA		BC	EQL,BAL3	CONDITION CODE SHOULD BE 3
0014F6	99 00 C 4F6		HPR		• PROGRAM MASK NOT STORED
0014FA	18 9 3	BAL3	LR	R9,R3	LOAD LINK INFORMATION INTO R9
0014FC	54 9 0 D 1FC		N	R9,CO	CLEAR ALL BUT I.L.C.
001500	59 9 0 D 230		C	R9,EIGHTO	
001504	47 8 0 C 50C		BC	EQL,BAL4	
001508	99 00 C 508		HPR		• INST. LENGTH CODE INCORRECT
00150C	58 9 0 D 220	BAL4	L	R9,ZEROC	LOAD R9 WITH PROGRAM MASK
001510	04 9 0		SPH	R9	SET PROGRAM MASK

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001512 45 3 0 C 51A
001516 99 00 C 516
00151A 04 8 0
00151C 18 9 3
00151E 54 9 0 D 228
001522 59 9 0 D 220
001526 47 8 0 C 532
00152A 99 00 C 52A
00152E 99 00 C 52E
001532 41 1 0 C 56A
001536 0A 00
001538 58 3 0 D 27C
00153C 58 6 0 D 280
001540 05 3 6
001542 19 4 8
001544 47 8 0 C 558
001548 99 00 C 548
00154C 18 4 8
00154E 07 F 3
001550 99 00 C 550
001554 99 00 C 554
001558 18 9 3
00155A 54 9 0 D 1FC
00155E 59 9 0 D 22C
001562 47 8 0 C 56E
001566 99 00 C 566
00156A 99 00 C 56A
00156E 41 1 0 C 586
001572 0A 00
001574 18 4 8
001576 57 4 0 D 2EC
00157A 47 8 0 C 582
00157E 99 00 C 57E
001582 18 4 8
001584 57 4 0 D 2FO
001588 59 4 0 D 2FO
00158C 47 8 0 C 594
001590 99 00 C 590
001594 18 4 5
001596 57 4 0 D 2EC
00159A 59 4 0 D 2FO
00159E 47 8 0 C 5A6
0015A2 99 00 C 5A2
0015A6 58 4 0 D 328

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BAL R3,BAL5
HPR
SPM
LR
N
C
BC
HPR
HPR
LA
SVC
L
R3,ERRAD2
R6,BALRAD
R3,R6
R4,R8
BC
ZERO,BALR2
HPR
LR
BCR
HPR
HPR
LR
N
C
BC
HPR
HPR
LA
SVC
X1A LR
X R4,R8
X R4,ZEROS
BC ZERO,X2A
HPR
X2A LR
X R4,R8
C R4,MINUS1
C R4,MINUS1
BC ZERO,X3A
HPR
X3A LR
X R4,R5
C R4,ZEROS
C R4,MINUS1
BC ZERO,X4A
HPR
X4A L
R4,ZERONE

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STORE PSW IN R3
• NO, BRANCH MADE
  CLEAR PROGRAM MASK
  LOAD LINK INFORMATION INTO R9
  CLEAR ALL BUT PROGRAM MASK
  IS IT CORRECT?
  IF EQUAL,BAL CHECKED
• PROGRAM MASK NOT CORRECT
• UNEXPECTED PROGRAM INTERRUPT

SET R3 TO ERROR ADDRESS
SET R6 TO SUBROUTINE ADDRESS
DO SUBROUTINE TESTING BALR
CHECK IF BRANCH WAS MADE
IF R4 EQUAL ZERO, BRANCH MADE
• ERROR, BRANCH NOT MADE
  CLEAR R4
  BRANCH TO ADR IN R3 (UNCOND)
• BALR SET R3 TO ZERO
• RETURN ADDRESS NOT STORED
  LOAD R9 WITH LINK INFORMATION
  CLEAR ALL BUT INST. LENGTH CODE
  DOES THE I.L.C. EQUAL ONE?
  IF EQUAL, BALR CHECKED
• I.L.C. DOES NOT EQUAL ONE
• UNEXPECTED PROGRAM INTERRUPT

BEGIN TESTING EXCLUSIVE OR
ZEROS OR ZEROS EQUAL ZERO
CONTINUE CHECKING IF CORRECT
• ZEROS OR ZEROS = ZERO

ZEROS OR ONES EQUAL ONES
CORRECT ANSWER?

• ZEROS OR ONES = ONES

ONES OR ZEROS EQUAL ONES

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0015AA	57 4 0 0 328		X	R4,ZERONE	CHECK KILL CARRYS FLIP FLOP
0015AE	47 8 0 C 5BA		BC	ZERO,XINTER	NEXT CHECK INTERRUPTS
0015B2	99 00 C 5B2		HPR		•
0015B6	99 00 C 5B6	XINT	HPR		• UNEXPECTED PROGRAM INT
0015BA	41 1 0 C 5C8	XINTER	LA	R1,XSPC	CHECK SPECIFICATION INTERRUPT
0015BE	0A 00		SVC	SRSS	
0015C0	57 4 0 0 331		X	R4,ODDBYT	NOT HALF WORD BOUNDARY
0015C4	99 00 C 5C4		HPR		• A031=1 SPEC INT NOT RECEIVED
0015C8	45 2 0 0 1AC	XSPC	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
0015CC	41 1 0 C 5DA		LA	R1,INTCHK	CHECK HALF WORD SPEC INTERRUPT
0015D0	0A 00		SVC	SRSS	
0015D2	57 4 0 0 322		X	R4,HFONEA	NOT WHOLE WORD BOUNDARY
0015D6	99 00 C 5D6		HPR		• A030=1 SPEC INTERRUPT NOT RCVD
0015DA	45 2 0 0 1AC	INTCHK	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
0015DE	41 1 0 C 5EC		LA	R1,OINTER	CHECK SPECIFICATION INTERRUPT
0015E2	0A 00		SVC	SRSS	
0015E4	50 4 0 0 331		ST	R4,ODDBYT	NOT HALF WORD BOUNDARY
0015E8	99 00 C 5E8		HPR		• SPEC INTERRUPT NOT RECEIVED
0015EC	45 2 0 0 1AC	OINTER	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
0015F0	41 1 0 C 5FE		LA	R1,NINTER	CHECK SPECIFICATION INTERRUPT
0015F4	0A 00		SVC	SRSS	
0015F6	56 4 0 0 331		O	R4,ODDBYT	NOT HALF WORD BOUNDARY
0015FA	99 00 C 5FA		HPR		• SPEC INTERRUPT NOT RECEIVED
0015FE	45 2 0 0 1AC	NINTER	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
001602	41 1 0 C 610		LA	R1,CINTER	CHECK SPECIFICATION INTERRUPT
001606	0A 00		SVC	SRSS	
001608	54 4 0 0 331		N	R4,ODDBYT	NOT HALF WORD BOUNDARY
00160C	99 00 C 60C		HPR		• SPEC INTERRUPT NOT RECEIVED
001610	45 2 0 0 1AC	CINTER	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
001614	41 1 0 C 622		LA	R1,LINTER	CHECK SPECIFICATION INTERRUPT
001618	0A 00		SVC	SRSS	
00161A	59 4 0 0 331		C	R4,ODDBYT	NOT HALF WORD BOUNDARY
00161E	99 00 C 61E		HPR		• SPEC INTERRUPT NOT RECEIVED
001622	45 2 0 0 1AC	LINTER	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
001626	41 1 0 C 634		LA	R1,CHINTR	CHECK SPECIFICATION INTERRUPT
00162A	0A 00		SVC	SRSS	
00162C	58 4 0 0 331		L	R4,ODDBYT	NOT HALF WORD BOUNDARY
001630	99 00 C 630		HPR		• SPEC INTERRUPT NOT RECEIVED
001634	45 2 0 0 1AC	CHINTR	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
001638	41 1 0 C 646		LA	R1,STHNTR	CHECK SPECIFICATION INTERRUPT
00163C	0A 00		SVC	SRSS	
00163E	49 4 0 0 331		CH	R4,ODDBYT	NOT HALF WORD BOUNDARY
001642	99 00 C 642		HPR		• SPEC INTERRUPT NOT RECEIVED
001646	45 2 0 0 1AC	STHNTR	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED

00164A	41 1 0 C 658		LA	R1,AINTER	
00164E	0A 00		SVC	SRSS	
001650	40 4 0 D 331		STH	R4,ODDBYT	NOT HALF WORD BOUNDARY
001654	99 00 C 654		HPR		• SPEC INTERRUPT NOT RECEIVED
001658	45 2 0 D 1AC	AINTER	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
00165C	41 1 0 C 66A		LA	R1,ABOE	CHECK SPECIFICATION INTERRUPT
001660	0A 00		SVC	SRSS	
001662	5A 4 0 D 331		A	R4,ODDBYT	NOT HALF WORD
001666	99 00 C 666		HPR		• SPEC INTERRUPT NOT RECEIVED
00166A	45 2 0 D 1AC	ABOE	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
00166E	41 1 0 C 680		LA	R1,SINTER	CHECK BINARY OVERFLOW INTERRUPT
001672	0A 00		SVC	SRSS	
001674	58 4 0 D 368		L	R4,WW7F	
001678	5A 4 0 D 290		A	R4,BOFCON	
00167C	99 00 C 67C		HPR		BINARY OVERFLOW INTER EXPECTED
001680	45 2 0 D 1B4	SINTER	BAL	R2,BINOFR	• BINARY OVERFLOW INT FAILURE
001684	41 1 0 C 692		LA	R1,SBOE	CHECK INTERRUPT CODE RECEIVED
001688	0A 00		SVC	SRSS	CHECK SPECIFICATION INTERRUPT
00168A	58 4 0 D 331		S	R4,ODDBYT	NOT HALF WORD BOUNDARY
00168E	99 00 C 68E		HPR		• SPEC INTERRUPT NOT RECEIVED
001692	45 2 0 D 1AC	SBOE	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
001696	41 1 0 C 6AB		LA	R1,ARINT	CHECK BINARY OVERFLOW INTERRUPT
00169A	0A 00		SVC	SRSS	
00169C	58 4 0 D 340		L	R4,MINSTN	
0016A0	58 4 0 D 368		S	R4,WW7F	
0016A4	99 00 C 6A4		HPR		CREATE SUBTRACT OVERFLOW
0016A8	45 2 0 D 1B4	ARINT	BAL	R2,BINOFR	• BINARY OVERFLOW INT FAILURE
0016AC	41 1 0 C 6C0		LA	R1,SRINT	CHECK INTERRUPT CODE RECEIVED
0016B0	0A 00		SVC	SRSS	CHECK AR BINARY OVERFLOW INT
0016B2	58 4 0 D 368		L	R4,WW7F	
0016B6	58 2 0 D 290		L	R2,BOFCON	SET UP REGISTERS TO SUBTRACT
0016BA	1A 4 2		AR	R4,R2	
0016BC	99 00 C 6BC		HPR		CREATE BINARY OVERFLOW
0016C0	45 2 0 D 1B4	SRINT	BAL	R2,BINOFR	• BINARY OVERFLOW INT FAILURE
0016C4	41 1 0 C 6DB		LA	R1,SSMENT	CHECK INTERRUPT CODE RECEIVED
0016C8	0A 00		SVC	SRSS	CHECK SR BINARY OVERFLOW INT
0016CA	58 4 0 D 340		L	R4,MINSTN	
0016CE	58 2 0 D 368		L	R2,WW7F	
0016D2	1B 4 2		SR	R4,R2	
0016D4	99 00 C 6D4		HPR		CREATE BINARY OVERFLOW
0016D8	45 2 0 D 1B4	SSMENT	BAL	R2,BINOFR	• BINARY OVERFLOW INTER FAILURE
0016DC	41 1 0 C 6EC		LA	R1,HPRINT	CHECK INTERRUPT CODE RECEIVED
0016E0	0A 01		SVC	SRPS	LOAD INTERRUPT RETURN ADDRESS
0016E2	80 00 D 2C8		SSM	AICON3	SUPERVISOR REG., PROBLEM STATE
					PRIVELEGED INSTRUCTION

```

0016E6 0A 00
0016E8 99 00 C 6E8
0016EC 45 2 0 D 1C4
0016F0 41 1 0 C 6FA
0016F4 0A 01
0016F6 99 00 C 6F6
0016FA 45 2 0 D 1C4
0016FE 41 1 0 C 70E
001702 0A 01
001704 9C 00 0 3FF
001708 0A 00
00170A 99 00 C 70A
00170E 45 2 0 D 1C4
001712 18 4 8
001714 41 1 0 C 73E
001718 0A 00
00171A 17 4 5
00171C 19 4 5
00171E 47 8 0 C 726
001722 99 00 C 722
001726 58 4 0 D 328
00172A 58 5 0 D 328
00172E 17 4 5
001730 58 5 0 D 2FD
001734 19 4 8
001736 47 8 0 C 742
00173A 99 00 C 73A
00173E 99 00 C 73E
001742 58 4 0 D 2FD
001746 41 1 0 C 762
00174A 0A 00
00174C 14 4 5
00174E 19 4 5
001750 47 8 0 C 754
001754 14 4 8
001756 47 8 0 C 766
00175A 99 00 C 75A
00175E 99 00 C 75E
001762 99 00 C 762
001766 58 4 0 D 2FD
00176A 41 1 0 C 790
00176E 0A 00
001770 16 4 5
001772 59 4 0 D 2FD

```

```

HPRINT SVC SRSS
HPR HPR
BAL R2,POEXR
LA R1,SIOINT
SVC SRPS
HPR
BAL R2,POEXR
SIOINT LA R1,XR1
SVC SRPS
SIO 1023(0)
SVC SRSS
HPR
BAL R2,POEXR
XR1 LR R4,R8
LA R1,XRINT
SVC SRSS
XR XR R4,R5
CR R4,R5
BC ZERO,XR2
HPR
XR2 L R4,ZERONE
L R5,ZERONE
XR R4,R5
L R5,MINUS1
CR R4,R8
BC ZERO,NR1
HPR
XRINT HPR
NR1 L R4,MINUS1
LA R1,NRINT
SVC SRSS
NR NR R4,R5
CR R4,R5
BC ZERO,NR2
NR2 NR R4,R8
BC ZERO,OR1
HPR
NRINT HPR
OR1 L R4,MINUS1
LA R1,ORINT
SVC SRSS
OR R4,R5
C R4,MINUS1

```

```

RETURN TO SUPERVISOR STATE
• NO PRIVILEGED OPERATION EXCEPT,
  CHECK INTERRUPT CODE RECEIVED
  LOAD INTERRUPT RETURN ADDRESS
  SUPERVISOR REG., PROBLEM STATE
• NO PRIVILEGED OPERATION EXCEPT,
  CHECK INTERRUPT CODE RECEIVED
  LOAD INTERRUPT RETURN ADDRESS
  SUPERVISOR REG., PROBLEM STATE
  PRIVILEGED INSTRUCTION
RETURN TO SUPERVISOR STATE
• NO PRIVILEGED OPERATION EXCEPT,
  CHECK INTERRUPT CODE RECEIVED
  BEGIN TESTING XR INSTRUCTION

```

ZEROS OR ONES EQUAL ONES?

CONTINUE TESTING IF CORRECT

```

• SET UP R5 FOR CHECK
  CHECK KILL CARRYS FLIP FLOP
  RESET R5 TO ALL ONES
  RESULT SHOULD EQUAL ZERO
  NEXT CHECK NR INSTRUCTION

```

```

• UNEXPECTED PROGRAM INTERRUPT
  NR CHECKED IN AR AND N TESTS

```

AND TOGETHER ONES AND ONES
TOTAL SHOULD EQUAL ONES

R4=ONES, R8=ZEROS, RESULT=ZEROS
NEXT CHECK OR INSTRUCTION

```

• ONES AND ONES NOT EQUAL ONES
• ONES AND ZEROS NOT EQUAL ZEROS
• UNEXPECTED PROGRAM INTERRUPT
  OR CHECKED IN AR AND O TESTS

```

ONES OR ONES SHOULD EQUAL ONES

001776	47 8 0 C 77E		BC	ZERO,ORZ	
00177A	99 00 C 77A		HPR		
00177E	58 4 0 D 2EC	ORZ	L	R4,ZEROS	
001782	16 4 5		OR	R4,R5	
001784	59 4 0 D 2FD		C	R4,MINUS1	
001788	47 8 0 C 794		BC	ZERO,CL1	NEXT CHECK COMPARE LOGICAL INS.
00178C	99 00 C 78C		HPR		
001790	99 00 C 790	ORINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001794	41 1 0 C 7C6	CL1	LA	R1,CLINT	
001798	0A 00		SVC	SRSS	
00179A	55 8 0 D 2FD		CL	R8,MINUS1	CHECK CL CONDITION CODES
00179E	47 4 0 C 78D		BC	LESS,CL2	FIRST OPERAND IS LESS THAN 2ND
0017A2	15 8 5		CLR	R8,R5	BOTH CL AND CLR ERROR?
0017A4	47 4 0 C 7AC		BC	LESS,CLERR	
0017A8	99 00 C 7A8		HPR		• CONDITION CODE ERROR FOR CL+CLR
0017AC	99 00 C 7AC	CLERR	HPR		• C. CODE ERROR FOR CL ONLY
0017B0	55 5 0 D 2EC	CL2	CL	R5,ZEROS	SECOND OPERAND IS LESS THAN 1ST
0017B4	47 2 0 C 7CA		BC	MORE,CLINTS	NEXT CHECK INTERRUPTS
0017B8	15 5 8		CLR	R5,R8	
0017BA	47 2 0 C 7C2		BC	MORE,CLMERR	
0017BE	99 00 C 7BE		HPR		• CONDITION CODE ERROR FOR CL+CLR
0017C2	99 00 C 7C2	CLMERR	HPR		• C. CODE ERROR FOR CL ONLY
0017C6	99 00 C 7C6	CLINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
0017CA	41 1 0 C 7D8	CLINTS	LA	R1,CLR1	CHECK SPECIFICATION INTERRUPT
0017CE	0A 00		SVC	SRSS	
0017D0	55 4 0 D 331		CL	R4,ODDBYT	NOT HALF WORD BOUNDARY
0017D4	99 00 C 7D4		HPR		• SPEC INTERRUPT NOT RECEIVED
0017D8	45 2 0 D 1AC	CLR1	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
0017DC	41 1 0 C 802		LA	R1,CLRINT	
0017E0	0A 00		SVC	SRSS	
0017E2	15 8 5		CLR	R8,R5	CONDITION CODES WORK FOR CL
0017E4	47 4 0 C 7EC		BC	LESS,CLR2	
0017E8	99 00 C 7E8		HPR		• C. CODE ERROR FOR CLR ONLY
0017EC	15 5 8	CLR2	CLR	R5,R8	R5=ONES, R8=ZEROS
0017EE	47 2 0 C 7F6		BC	MORE,CLR3	
0017F2	99 00 C 7F2		HPR		• C. CODE ERROR FOR CLR ONLY
0017F6	55 8 0 D 2EC	CLR3	CL	R8,ZEROS	CHECK CONDITION CODE OF ZERO
0017FA	47 8 0 C 806		BC	ZERO,LH1	NEXT CHECK LH INSTRUCTION
0017FE	99 00 C 7FE		HPR		• CONDITION CODE SHOULD EQUAL 0
001802	99 00 C 802	CLRINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001806	41 1 0 C 854	LH1	LA	R1,LHINT	
00180A	0A 00		SVC	SRSS	
00180C	48 4 0 D 2FD		LH	R4,MINUS1	CHECK HALF WORD INSTRUCTIONS
001810	59 4 0 D 2FD		C	R4,MINUS1	HALF WORD SHOULD SIGN EXTEND

```

001814 47 8 0 C 832
001818 18 4 8
00181A 4A 4 0 D 2F0
00181E 59 4 0 D 2F0
001822 47 8 0 C 82A
001826 99 00 C 826
00182A 48 4 0 D 2F0
00182E 99 00 C 82E
001832 48 4 0 D 2EC
001836 59 4 0 D 2EC
00183A 47 8 0 C 858
00183E 18 4 8
001840 4A 4 0 D 2EC
001844 47 8 0 C 84C
001848 99 00 C 848
00184C 48 4 0 D 2EC
001850 99 00 C 850
001854 99 00 C 854
001858 41 1 0 C 866
00185C 0A 00
00185E 48 4 0 D 331
001862 99 00 C 862
001866 45 2 0 D 1AC
00186A 41 1 0 C 882
00186E 0A 00
001870 18 4 8
001872 4A 4 0 D 2F0
001876 59 4 0 D 2F0
00187A 47 8 0 C 886
00187E 99 00 C 87E
001882 99 00 C 882
001886 41 1 0 C 894
00188A 0A 00
00188C 4A 4 0 D 331
001890 99 00 C 890
001894 45 2 0 D 1AC
001898 41 1 0 C 8AA
00189C 0A 00
00189E 58 4 0 D 368
0018A2 4A 4 0 D 2C0
0018A6 99 00 C 8A6
0018AA 45 2 0 D 1B4
0018AE 41 1 0 C 8C4
0018B2 0A 00

```

```

BC      ZERO,LH2
LR      R4,R8
AH      R4,MINUS1
C       R4,MINUS1
BC      ZERO,LHERR
HPR     LHERR
HPR     LH
HPR     LH2
HPR     LH
C       R4,ZEROS
C       R4,ZEROS
BC      ZERO,LHINTS
LR      R4,R8
AH      R4,ZEROS
BC      ZERO,LHIERR
HPR     LHIERR
HPR     LH
HPR     LHIERR
HPR     LHINT
HPR     LHINTS
LA      R1,AH1
SVC     SRSS
LH      R4,ODDBYT
HPR     R2,SPECIR
BAL     R1,AHINT
LA      R1,AHINT
SVC     SRSS
LR      R4,R8
AH      R4,MINUS1
C       R4,MINUS1
BC      ZERO,AHINTS
HPR     R1,AHBOF
HPR     SRSS
LA      R4,ODDBYT
SVC     R2,SPECIR
AH      R1,SH1
HPR     SRSS
HPR     R4,WW7F
HPR     R4,AICON1
BAL     B2,BINOF
LA      R1,SHINT
SVC     SRSS

```

- LOAD DOESN'T WORK, TRY AH
- HALF WORD SHOULD SIGN EXTEND
- TOTAL EQUAL WHOLE WORD MINUS 1
- BRANCH IF ADD CORRECT
- NEITHER LH OR AH WORKS RIGHT
- SET UP ERROR CONDITIONS
- AH WORKS, LH DOESN'T
- TEST LH WITH ZEROS
- NO SIGN EXTENSION WANTED
- NEXT CHECK INTERRUPTS
- LOAD DOESN'T WORK, TRY AH
- WHOLE WORD RESULT EQUAL ZERO
- NEITHER LH OR AH WORKS WITH 0'S
- RESET ERROR CONDITIONS
- AH WORKS FOR 0'S, LH DOESN'T
- UNEXPECTED PROGRAM INTERRUPT
- CHECK SPECIFICATION INTERRUPT
- NOT HALF WORD BOUNDARY
- SPEC INTERRUPT NOT RECEIVED
- CHECK INTERRUPT CODE RECEIVED
- TEST ADD HALFWORD INSTRUCTION
- ALL SEQUENCES ALREADY CHECKED
- ADD ZEROS AND ONES
- NEXT CHECK INTERRUPTS
- ERROR IN AH CIRCUITRY
- UNEXPECTED PROGRAM INTERRUPT
- CHECK SPECIFICATION INTERRUPT
- NOT HALF WORD BOUNDARY
- SPEC INTERRUPT NOT RECEIVED
- CHECK INTERRUPT CODE RECEIVED
- CHECK BINARY OVERFLOW INTERRUPT
- SET R4 TO ALL ONES
- CREATE OVERFLOW CONDITION
- BINARY OVFL INT NOT RECEIVED
- CHECK INTERRUPT CODE RECEIVED

0018B4	58 4 0 D 33C	L	R4,WPCON	SH SEQUENCES ALREADY CHECKED
0018B8	48 4 0 D 338	SH	R4,HWPCON	SUBTRACT CONSTANT FROM ITSELF
0018BC	47 8 0 C 8C9	BC	ZERO,SHINTS	NEXT CHECK INTERRUPTS
0018C0	99 00 C 8C0	HPR		• SH INSTRUCTION ERROR
0018C4	99 00 C 8C4	HPR		• UNEXPECTED PROGRAM INTERRUPT
0018C8	41 1 0 C 8D6	LA	R1,SHBOF	CHECK SPECIFICATION INTERRUPT
0018CC	0A 00	SVC	SRSS	
0018CE	48 4 0 D 331	SH	R4,ODDBYT	NOT HALF WORD BOUNDARY
0018D2	99 00 C 8D2	HPR		• SPEC INTERRUPT NOT RECEIVED
0018D6	45 2 0 D 1AC	BAL	R2,SPECIR	CHECK INTERRUPT CODE RECEIVED
0018DA	41 1 0 C 8EC	LA	R1,STC1	CHECK BINARY OVERFLOW INTERRUPT
0018DE	0A 00	SVC	SRSS	
0018E0	58 4 0 D 340	L	R4,MINSTN	
0018E4	58 4 0 D 368	S	R4,WW7F	CREATE SUBTRACT OVERFLOW
0018E8	99 00 C 8E8	HPR		• BINARY OVFL INT NOT RECEIVED
0018EC	45 2 0 D 1B4	BAL	R2,BINOFR	CHECK INTERRUPT CODE RECEIVED
0018F0	41 1 0 C 96E	LA	R1,STCINT	
0018F4	0A 00	SVC	SRSS	
0018F6	50 8 0 D 330	ST	R8,EVNBYT	
0018FA	41 9 0 0 004	LA	R9,4(,0)	LOAD R9 WITH FOUR
0018FE	42 9 0 D 331	STC	R9,ODDBYT	TEST STORE CHARACTER INST
001902	58 4 0 D 330	L	R4,EVNBYT	WRITE LOWER FF CHECKED
001906	59 4 0 D 2A4	C	R4,STCON1	RESULT EQUAL 00040000
00190A	47 8 0 C 93E	BC	ZERO,STC2	
00190E	50 8 0 D 330	ST	R8,EVNBYT	
001912	42 9 0 D 330	STC	R9,EVNBYT	WRITE UPPER FF USED
001916	58 4 0 D 330	L	R4,EVNBYT	
00191A	59 4 0 D 2A8	C	R4,STCON3	RESULT EQUAL 04000000
00191E	47 8 0 C 936	BC	ZERO,STCER1	
001922	92 04 D 331	MVI	ODDBYT,X'04'	CHECK IF BYTE SWITCH WORKS
001926	58 4 0 D 330	L	R4,EVNBYT	
00192A	59 4 0 D 2A4	C	R4,STCON1	RESULT EQUAL 00040000
00192E	47 8 0 C 93A	BC	ZERO,STCER2	
001932	99 00 C 932	HPR		• NOT DISABLING WR UP AND WR LOW
001936	99 00 C 936	HPR		• WRITE LOWER FF MALFUNCTION
00193A	99 00 C 93A	HPR		• BYTE SWITCH ERROR
00193E	50 8 0 D 330	ST	R8,EVNBYT	CLEAR EVNBYT
001942	42 9 0 D 330	STC	R9,EVNBYT	
001946	58 4 0 D 330	L	R4,EVNBYT	
00194A	59 4 0 D 2A8	C	R4,STCON3	RESULT EQUAL 04000000
00194E	47 8 0 C 956	BC	ZERO,STC3	CONTINUE TEST
001952	99 00 C 952	HPR		• WRITE UPPER FF MALFUNCTION
001956	50 8 0 D 330	ST	R8,EVNBYT	CLEAR EVNBYT
00195A	42 5 0 D 331	STC	R5,ODDBYT	CHEK IF WR UP&LOW DISABLED

```

00195E 58 4 0 D 330
001962 59 4 0 D 284
001966 47 8 0 C 972
00196A 99 00 C 96A
00196E 99 00 C 96E
001972 41 1 0 C 9C6
001976 0A 00
001978 50 8 0 D 330
00197C 42 5 0 D 331
001980 18 4 8
001982 43 4 0 D 331
001986 59 4 0 D 280
00198A 47 8 0 C 9AC
00198E 50 8 0 D 330
001992 42 5 0 D 330
001996 18 4 8
001998 43 4 0 D 330
00199C 59 4 0 D 280
0019A0 47 8 0 C 9A8
0019A4 99 00 C 9A4
0019A8 99 00 C 9A8
0019AC 50 8 0 D 330
0019B0 42 5 0 D 330
0019B4 18 4 8
0019B6 43 4 0 D 330
0019BA 59 4 0 D 280
0019BE 47 8 0 C 9CA
0019C2 99 00 C 9C2
0019C6 99 00 C 9C6
0019CA 41 1 0 C A1C
0019CE 0A 00
0019D0 50 8 0 D 330
0019D4 92 FF D 331
0019D8 58 4 0 D 330
0019DC 59 4 0 D 284
0019E0 47 8 0 C 9E8
0019E4 99 00 C 9E4
0019E8 50 5 0 D 330
0019EC 92 00 D 330
0019F0 58 4 0 D 330
0019F4 59 4 0 D 28C
0019F8 47 8 0 C A20
0019FC 59 5 0 D 330
001A00 47 8 0 C A14

```

STCINT
IC1

ICERR
IC2

ICINT
MVI1

MVI2

```

L      R4,EVNBYT
C      R4,MVICON
BC     ZERO,IC1
HPR
HPR
LA     R1,ICINT
SVC    SRSS
ST     R8,EVNBYT
STC    R5,ODDBYT
LR     R4,R8
IC     R4,ODDBYT
C      R4,ICCON
BC     ZERO,IC2
ST     R8,EVNBYT
STC    R5,EVNBYT
LR     R4,R8
IC     R4,EVNBYT
C      R4,ICCON
BC     ZERO,ICERR
HPR
HPR
ST     R8,EVNBYT
STC    R5,EVNBYT
LR     R4,R8
IC     R4,EVNBYT
C      R4,ICCON
BC     ZERO,MVI1
HPR
HPR
LA     R1,MVI1INT
SVC    SRSS
ST     R8,EVNBYT
MVI    ODDBYT,X'FF'
L      R4,EVNBYT
C      R4,MVICON
BC     ZERO,MVI2
HPR
ST     R5,EVNBYT
MVI    EVNBYT,X'00'
L      R4,EVNBYT
C      R4,MVICN3
BC     ZERO,N11
C      R5,EVNBYT
BC     ZERO,MVIERR

```

- COMPARE RESULT TO FFO00000
NEXT CHECK INSERT CHARACTER
- CHECK FOR ONE FAILING BIT
 - UNEXPECTED PROGRAM INTERRUPT

- CLEAR WORKING STORAGE
SET ODDBYT TO FF
CLEAR R4
BEGIN CHECKING INSERT CHARACTER
R4 SHOULD EQUAL 00000=OFF
CONTINUE TESTING
CLEAR WORKING STORAGE
SET EVNBYT TO FF
CLEAR R4
CHECK STORAGE TO DO IF S131=0
R4 SHOULD EQUAL 00000OFF

- EVEN AND ODD BYTES DON'T WORK
 - S131=0 WORKS, S131=1 DOESN'T
- CLEAR WORKING STORAGE
SET EVNBYT TO FF
CLEAR R4
CHECK STORAGE TO DIF S131=0
R4 SHOULD EQUAL 00000OFF
NEXT CHECK MOVE IMMEDIATE INST.
- S131=0 WORKS, S131=1 DOESN'T
 - UNEXPECTED PROGRAM INTERRUPT

- CHECK MOVE IMMEDIATE
MVI WITH WRITE LOWER FLIP FLOP
LOAD WHOLE WORD
R4 SHOULD EQUAL 00FF0000
CONTINUE TEST IF OK
- ENABLES FAILING FOR 90-97
- ONES IN WORKING STORAGE
MVI WITH WRITE UPPER FLIP FLOP

- R4 SHOULD EQUAL 00FFFFFFF
CHECK NEXT INSTRUCTION IF OK
DID ANYTHING STORE?

```

001A04 58 4 0 D 330
001A08 59 4 0 D 2B8
001A0C 47 8 0 C A18
001A10 99 00 C A10
001A14 99 00 C A14
001A18 99 00 C A18
001A1C 99 00 C A1C
001A20 41 1 0 C A86
001A24 0A 00
001A26 50 5 0 D 330
001A2A 94 00 D 331
001A2E 58 4 0 D 330
001A32 59 4 0 D 2B8
001A36 47 8 0 C A62
001A3A 59 4 0 D 2BC
001A3E 47 8 0 C A5A
001A42 50 8 0 D 330
001A46 94 FF D 330
001A4A 58 4 0 D 330
001A4E 59 4 0 D 2AC
001A52 47 8 0 C A5E
001A56 99 00 C A56
001A5A 99 00 C A5A
001A5E 99 00 C A5E
001A62 50 5 0 D 330
001A66 94 00 D 330
001A6A 58 4 0 D 330
001A6E 59 4 0 D 2BC
001A72 47 8 0 C A8A
001A76 59 4 0 D 2B8
001A7A 99 00 C A7A
001A7E 47 8 0 C A82
001A82 99 00 C A82
001A86 99 00 C A86
001A8A 41 1 0 C AFO
001A8E 0A 00
001A90 50 8 0 D 330
001A94 96 FF D 331
001A98 58 4 0 D 330
001A9C 59 4 0 D 2B4
001AA0 47 8 0 C ACO
001AA4 50 8 0 D 330
001AA8 96 FF D 330
001AAC 58 4 0 D 330

```

```

MVIERR
MVIERR2
MVIINT
N11

```

```

NIERR1
NIERR2
N12

```

```

N1ZERR
NIINT
O11

```

```

L
C
BC
HPR
HPR
HPR
HPR
LA
SVC
ST
NI
L
C
BC
C
BC
ST
NI
L
C
BC
C
HPR
BC
HPR
HPR
LA
SVC
ST
OI
L
C
BC
ST
OI
L

```

```

R4,EVNBYT
R4,MVICN2
ZERO,MVIERR2

R1,NIINT
SRSS
R5,EVNBYT
ODDBYT,X'00'
R4,EVNBYT
R4,MVICN2
ZERO,N12
R4,MVICN3
ZERO,NIERR1
R8,EVNBYT
EVNBYT,X'FF'
R4,EVNBYT
R4,STCON2
ZERO,NIERR2

R5,EVNBYT
EVNBYT,X'00'
R4,EVNBYT
R4,MVICN3
ZERO,O11
R4,MVICN2

ZERO,N1ZERR

R1,O1INT
SRSS
R8,EVNBYT
ODDBYT,X'FF'
R4,EVNBYT
R4,MVICN3
ZERO,O12
R8,EVNBYT
EVNBYT,X'FF'
R4,EVNBYT

```

```

COMPARE TO FFOOFFFF
DID WRONG BYTE GET SET

```

- CHECK R4 FOR ERROR INDICATION
- NO BYTE SET, UPPER SHOULD BE
- LOWER BYTE SET IN ERROR
- UNEXPECTED PROGRAM INTERRUPT

```

SET WORKING STORAGE TO ONES
CHECK AND IMMEDIATE INSTRUCTION
LAST BYTE SHOULD BE CLEARED
RESULT EQUAL FFOOFFFF
CONTINUE TEST
ISOLATE ERROR, R4=00FFFFFF
WAS WRONG BYTE SET
IS OV ENABLED INSTEAD OF AND?

```

```

DOES RESULT EQUAL FFO00000

```

- GENERAL ENABLE ERROR
- WRONG BYTE BEING ENABLED
- OR BEING DONE, NOT AND
- TEST FOR UPPER BYTE ENABLES
- SHOULD CLEAR EVNBYT

```

RESULT SHOULD EQUAL 00FFFFFF
CHECK OR INSTRUCTION NEXT
IS WRONG BYTE EFFECTED?

```

- EVEN BYTE AND DOESN'T WORK

- ODD BYTE ALWAYS ENABLED
- UNEXPECTED PROGRAM INTERRUPT

```

BEGIN TESTING OR IMMEDIATE
ZEROS OR ONES EQUAL ONES

```

```

RESULT SHOULD EQUAL 00FF0000

```

```

CLEAR WORKING STORAGE
CHK STORAGE TO D-LOW IF S131>0

```

001A80	59 4 0 D 2AC		C	R4,STCON2	RESULT SHOULD EQUAL FF000000
001A84	47 8 0 C ABC		BC	ZERO,OIERR	
001A88	99 00 C ABB		HPR		• OR DOESN'T WORK FOR EVEN OR ODD
001ABC	99 00 C ABC	OIERR	HPR		• EVEN BYTE OK, ODD BYTE FAILS
001AC0	50 8 0 D 330	O12	ST	R8,EVNBYT	CLEAR WORKING STORAGE
001AC4	96 FF D 330		O1	EVNBYT,X'FF'	CHK STORAGE TO D=LOW IF S131>0
001AC8	58 4 0 D 330		L	R4,EVNBYT	
001ACC	59 4 0 D 2AC		C	R4,STCON2	RESULT SHOULD EQUAL FF000000
001AD0	47 8 0 C AD8		BC	ZERO,O13	
001AD4	99 00 C AD4		HPR		• S131=1 WORKS, S131=0 DOESN'T
001AD8	50 5 0 D 330	O13	ST	R5,EVNBYT	
001ADC	96 FF D 330		O1	EVNBYT,X'FF'	CHECK IF ONE OR ONE EQUALS ONE
001AE0	59 5 0 D 330		C	R5,EVNBYT	RESULT SHOULD EQUAL FFFFFFFF
001AE4	47 8 0 C AF4		BC	ZERO,X11	NEXT CHECK EXCLUSIVE OR
001AE8	58 4 0 D 330		L	R4,EVNBYT	SET UP ERROR CONDITIONS
001AEC	99 00 C AEC		HPR		• ONES OR ONES NOT EQUAL ONES
001AF0	99 00 C AFD	O1INT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001AF4	41 1 0 C B12	X11	LA	R1,X1INT	
001AF8	0A 00		SVC	SRSS	
001AFA	50 5 0 D 330		ST	R5,EVNBYT	BEGIN CHECKING EXCLUSIVE OR
001AFE	97 FF D 330		X1	EVNBYT,X'FF'	ONES OR ONES SHOULD EQUAL ZERO
001B02	58 4 0 D 330		L	R4,EVNBYT	
001B06	59 4 0 D 2BC		C	R4,MVICN3	RESULT SHOULD EQUAL 00FFFFFF
001B0A	47 8 0 C B16		BC	ZERO,A11	CHECK ADD IMMEDIATE
001B0E	99 00 C B0E		HPR		• EXCLUSIVE OR IMMEDIATE ERROR
001B12	99 00 C B12	X1INT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001B16	41 1 0 C B7E	A11	LA	R1,A1INT	
001B1A	0A 00		SVC	SRSS	
001B1C	50 8 0 D 330		ST	R8,EVNBYT	CLEAR WORKING STORAGE
001B20	93 01 D 330		A1	EVNBYT,X'01'	BEGIN CHECKING ADD IMMEDIATE
001B24	58 4 0 D 330		L	R4,EVNBYT	
001B28	59 4 0 D 2C0		C	R4,A1CON1	RESULT SHOULD EQUAL 00010000
001B2C	47 8 0 C B4A		BC	ZERO,A12	CONTINUE CHECKING
001B30	59 4 0 D 2C4		C	R4,A1CON2	COMPARE RESULT TO 01010000
001B34	47 8 0 C B42		BC	ZERO,A1ERR1	
001B38	19 8 4		CR	R8,R4	COMPARE RESULT TO ZERO
001B3A	47 8 0 C B46		BC	ZERO,A1ERR2	
001B3E	99 00 C B3E		HPR		• CHECK FOR CONSTANT SIGN EXTENS.
001B42	99 00 C B42	A1ERR1	HPR		• BYTE SWITCH WASN'T DISABLED
001B46	99 00 C B46	A1ERR2	HPR		• CHECK WRITE LOWER FLIP FLOP
001B4A	58 4 0 D 2C0	A12	L	R4,A1CON1	
001B4E	50 4 0 D 330		ST	R4,EVNBYT	SET EVNBYT TO 00010000
001B52	93 01 D 330		A1	EVNBYT,X'01'	CHECK STORAGE TO DO FLIP FLOP
001B56	58 4 0 D 330		L	R4,EVNBYT	RESULT SHOULD EQUAL 00020000

001B5A	59 4 0 D 2D4		C	R4,AICON6	
001B5E	47 8 0 C B66		BC	ZERO,AI3	
001B62	99 00 C B62		HPR		• STORAGE TO DD ERROR
001B66	50 8 0 D 330	AI3	ST	R8,EVNBYT	CLEAR WORKING STORAGE
001B6A	93 F0 D 330		AI	EVNBYT,240	CHECK SIGN EXTENSION & WR UP FF
001B6E	58 4 0 D 330		L	R4,EVNBYT	
001B72	59 4 0 D 2CC		C	R4,AICON4	RESULT SHOULD EQUAL FFF00000
001B76	47 8 0 C B82		BC	ZERO,AIINTS	NEXT CHECK INTERRUPTS
001B7A	99 00 C B7A		HPR		• SIGN EXTENSION OR WR: UPPER FF
001B7E	99 00 C B7E	AIINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001B82	41 1 0 C B98	AIINTS	LA	R1,CL11	CHECK BINARY OVERFLOW INTERRUPT
001B86	0A 00		SVC	SRSS	
001B88	58 6 0 D 368		L	R6,WW7F	
001B8C	50 6 0 D 330		ST	R6,EVNBYT	SET EVNBYT TO ALL ONES
001B90	93 7F D 330		AI	EVNBYT,X'7F'	CREATE BINARY OVERFLOW
001B94	99 00 C B94		HPR		• BINARY OVFL INT NOT RECEIVED
001B98	45 2 0 D 1B4	CL11	BAL	R2,BINOFR	CHECK INTERRUPT CODE RECEIVED
001B9C	41 1 0 C BD2		LA	R1,CLIINT	
001BA0	0A 00		SVC	SRSS	
001BA2	92 7F D 330		MVI	EVNBYT,X'7F'	
001BA6	95 7F D 330		CLI	EVNBYT,X'7F'	COMPARE OPERANDS EQUAL
001BAA	47 8 0 C BBA		BC	ZERO,CL12	CONTINUE CHECKING
001BAE	47 4 0 C BB6		BC	LESS,CLIERR	
001BB2	99 00 C BB2		HPR		• COND CODE ERROR SAYS OP1>OP2
001BB6	99 00 C BB6	CLIERR	HPR		• COND CODE ERROR SAYS OP2>OP1
001BBA	95 FF D 330	CL12	CLI	EVNBYT,X'FF'	COMPARE,OP1>7F,OP2>FF
001BBE	47 4 0 C BC6		BC	LESS,CL13	
001BC2	99 00 C BC2		HPR		• CC SAYS OP1 NOT LESS THAN OP2
001BC6	95 7E D 330	CL13	CLI	EVNBYT,X'7E'	COMPARE,OP1>7F,OP2>99
001BCA	47 2 0 C BD6		BC	MORE,MVC1	NEXT CHECK MOVE CHARACTER INST.
001BCE	99 00 C BCE		HPR		• CC SAYS OP1 NOT MORE THAN OP2
001BD2	99 00 C BD2	CLIINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001BD6	41 1 0 C C04	MVC1	LA	R1,MVCINT	
001BDA	0A 00		SVC	SRSS	
001BDC	02 03 D 2D8 D 2DC		MVC	MVZERO(4),MVONES	BEGIN TESTING SS INSTRUCTIONS
001BE2	59 5 0 D 2D8		C	R5,MVZERO	RESULT SHOULD EQUAL ONES
001BE6	47 7 0 C D50		BC	NONZ,SSERR1	BRANCH TO ISOLATE FAULT
001BEA	50 8 0 D 2D8		ST	R8,MVZERO	RESET MVZERO TO ZEROS
001BEE	02 00 D 2D8 D 2DC		MVC	MVZERO(1),MVONES	TEST BYTE COUNTING
001BF4	58 4 0 D 2D8		L	R4,MVZERO	
001BF8	59 4 0 D 2AC		C	R4,STCON2	RESULT SHOULD EQUAL FFF00000
001BFC	47 8 0 C C08		BC	ZERO,MVN1	NEXT TEST MOVE NUMERICS
001C00	99 00 C C00		HPR		• MOVE DOESN'T WORK FOR ONE BYTE
001C04	99 00 C C04	MVCINT	HPR		• UNEXPECTED PROGRAM INTERRUPT

001C08	41 1 0 C C3E	MVN1	LA	R1,MVNINT	
001C0C	0A 00		SVC	SRSS	
001C0E	50 8 0 D 2D8		ST	R8,MVZERO	RESET MVZERO TO ZEROS
001C12	D1 03 D 2E0 D 2D8		MVN	ZEROFF(4),MVZERO	TEST IF NUMERICS MOVE
001C18	58 4 0 D 2E0		L	R4,ZEROFF	MOVED ZEROS TO 0F0F0F0F
001C1C	59 4 0 D 2EC		C	R4,ZEROS	RESULT SHOULD EQUAL ZERO
001C20	47 8 0 C C28		BC	ZERO,MVN2	CONTINUE TESTING MOVE NUMERICS
001C24	99 00 C C24		HPR		• LOWER 4 BITS NOT BEING CLEARED
001C28	D1 03 D 2D8 D 2DC	MVN2	MVN	MVZERO(4),MVONES	ALL ONES MOVED TO ALL ZEROS
001C2E	58 4 0 D 2D8		L	R4,MVZERO	SIGN BIT SHOULD NOT SET
001C32	59 4 0 D 2E4		C	R4,ZEROF2	RESULT SHOULD EQUAL 0F0F0F0F
001C36	47 8 0 C C42		BC	ZERO,MVZ1	NEXT CHECK MOVE ZONES
001C3A	99 00 C C3A		HPR		• SIGN BEING SET ALSO
001C3E	99 00 C C3E	MVNINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001C42	41 1 0 C C5E	MVZ1	LA	R1,MVZINT	
001C46	0A 00		SVC	SRSS	
001C48	D3 03 D 2E8 D 2E4		MVZ	FFZERO(4),ZEROF2	ZONES SHOULD BE CLEARED
001C4E	58 4 0 D 2E8		L	R4,FFZERO	ZONES SHOULD BE CLEARED
001C52	59 4 0 D 2EC		C	R4,ZEROS	RESULT SHOULD EQUAL ZERO
001C56	47 8 0 C C62		BC	ZERO,OC1	NEXT CHECK OR CHARACTERS
001C5A	99 00 C C5A		HPR		• 0F0F0F0F TO F0F0F0F0 = ZERO
001C5E	99 00 C C5E	MVZINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001C62	41 1 0 C C80	OC1	LA	R1,OCINT	
001C66	0A 00		SVC	SRSS	
001C68	D2 03 D 2F4 D 2B4		MVC	WKSTG(4),MVICON	BEGIN TESTING OR CHARACTERS
001C6E	D6 03 D 2F4 D 2BC		OC	WKSTG(4),MVICN3	00FF0000 OR 00FFFFFF
001C74	58 4 0 D 2F4		L	R4,WKSTG	
001C78	59 4 0 D 2BC		C	R4,MVICN3	RESULT SHOULD EQUAL 00FFFFFF
001C7C	47 8 0 C CB4		BC	ZERO,NC1	NEXT TRY AND CHARACTERS
001C80	D2 03 D 2F4 D 2BC		MVC	WKSTG(4),MVICN3	OR DOESN'T WORK, TRY AND
001C86	D4 03 D 2F4 D 2B0		NC	WKSTG(4),ICCON	00FFFFFF AND 000000FF
001C8C	58 4 0 D 2F4		L	R4,WKSTG	
001C90	59 4 0 D 2B0		C	R4,ICCON	RESULT SHOULD EQUAL 000000FF
001C94	47 8 0 C C9C		BC	ZERO,OCERR1	
001C98	99 00 C C98		HPR		• AND, OR BOTH DON'T WORK
001C9C	D2 03 D 2F4 D 2B4	OCERR1	MVC	WKSTG(4),MVICON	SET UP ERROR CONDITIONS
001CA2	D6 03 D 2F4 D 2BC		OC	WKSTG(4),MVICN3	
001CA8	58 4 0 D 2F4		L	R4,WKSTG	
001CAC	99 00 C CAC		HPR		• AND CHAR. WORKS, OR FAILS
001CB0	99 00 C CB0	OCINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001CB4	41 1 0 C CD6	NC1	LA	R1,NCINT	
001CB8	0A 00		SVC	SRSS	
001CBA	D2 03 D 2F4 D 2B0		MVC	WKSTG(4),ICCON	SET UP WORKING STORAGE
001CC0	D4 03 D 2F4 D 2BC		NC	WKSTG(4),MVICN3	00FFFFFF AND 000000FF

001CC6	58 4 0 D 2F4		L	R4,WKSTG	
001CCA	59 4 0 D 2B0		C	R4,ICCON	RESULT SHOULD EQUAL 000000FF
001CCE	47 8 0 C CDA		BC	ZERO,XC1	CHECK EXCLUSIVE OR CHARACTERS
001CD2	99 00 C CD2		HPR		• OR CHAR. WORKS, AND DOESN'T
001CD6	99 00 C CD6	NCINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001CDA	41 1 0 C D18	XC1	LA	R1,XCINT	
001CDE	0A 00		SVC	SRSS	
001CE0	02 03 D 2F4 D 2F8		MVC	WKSTG(4),XCAR1	
001CE6	D7 03 D 2F4 D 2FC		XC	WKSTG(4),XCAR2	FFFF0000 OR FFO0FF00
001CEC	58 4 0 D 2F4		L	R4,WKSTG	
001CF0	59 4 0 D 300		C	R4,XCAR3	RESULT SHOULD EQUAL 00FFFFFF
001CF4	47 8 0 C CFC		BC	ZERO,CHCCCD	NEXT CHECK CONDITION CODES
001CF8	99 00 C CFB		HPR		• EXCLUSIVE OR CHARACTERS FAILS
001CFC	D7 03 D 2F4 D 300	CHCCCD	XC	WKSTG(4),XCAR3	TEST CONDITION CODE OF ZERO
001D02	47 8 0 C D0A		BC	ZERO,CHCC2	ZERO CONDITION OK
001D06	99 00 C D06		HPR		• CONDITION CODE ERROR FOR CC=0
001D0A	D6 03 D 2F4 D 2F0	CHCC2	OC	WKSTG(4),MINUS1	TEST CONDITION CODE OF ONE
001D10	47 7 0 C D1C		BC	NONZ,CLC1	ONE CONDITION CODE IS SET
001D14	99 00 C D14		HPR		• CONDITION CODE ERROR FOR CC=1
001D18	99 00 C D18	XCINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001D1C	41 1 0 C D4C	CLC1	LA	R1,CLCINT	
001D20	0A 00		SVC	SRSS	
001D22	D5 03 D 2EC D 2F0		CLC	ZEROS(4),MINUS1	CHECK COMPARE LOGICAL CHARACTER
001D28	47 4 0 C D30		BC	LESS,CLC2	
001D2C	99 00 C D2C		HPR		• COMPARE ERROR, CC SHOULD = 1
001D30	D5 03 D 2F0 D 2EC	CLC2	CLC	MINUS1(4),ZEROS	
001D36	47 2 0 C D3E		BC	MORE,CL3	
001D3A	99 00 C D3A		HPR		• COMPARE ERROR, CC SHOULD = 2
001D3E	D5 03 D 2F0 D 2F0	CL3	CLC	MINUS1(4),MINUS1	COMPARE EQUAL OPERANDS
001D44	47 8 0 C D90		BC	ZERO,DECINS	NEXT CHECK BRANCH ON COUNT
001D48	99 00 C D48		HPR		• COMPARE ERROR, CC SHOULD = 2
001D4C	99 00 C D4C	CLCINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
001D50	50 5 0 D 334	SSERR1	ST	R5,WRKSTG	ERROR, KNOW MVC DOESN'T WORK
001D54	D4 03 D 334 D 2F0		NC	WRKSTG(4),MINUS1	TRY ANOTHER DX INSTRUCTION
001D5A	47 8 0 C D84		BC	ZERO,MVHLT	BRANCH IF AND CHARACTERS OK
001D5E	FA 3 3 D 314 D 318		AP	EGT(4),TWOCON(4)	TRY FX INSTRUCTION
001D64	58 4 0 D 314		L	R4,EGT	EIGHT PLUS TWO SHOULD EQUAL 100
001D68	59 4 0 D 31C		C	R4,TENDEC	
001D6C	47 8 0 C D88		BC	ZERO,DXHLT	BRANCH IF ADD DECIMAL OK
001D70	58 4 0 D 2F0		L	R4,MINUS1	TRY SHIFT INSTRUCTION
001D74	88 4 0 D 009		SRL	R4,9(0)	
001D78	59 4 0 D 310		C	R4,NEWCON	CHECK RESULT OF SHIFT
001D7C	47 8 0 C D8C		BC	ZERO,FXHLT	
001D80	99 00 C D80		HPR		• SS AND SHIFT BOTH FAIL

001E46	99 00 C E46	***	HPR	INDICATE ERROR RESULT	
001E4A	FA 3 3 D 3EE D 3F2	AP2	AP	POSAP3(4),NEGAP3(4)	* NEGATIVE DOESN'T ADD PROPERLY
001E50	47 8 0 C E5C		BC	ZERO,AP3	SHOULD GIVE ZERO RESULT
001E54	58 4 0 D 3EE		L	R4,POSAP3	ZERO RESULT CONDITION OK
001E58	99 00 C E58		HPR		DISPLAY ERROR
001E5C	FA 3 3 D 3EE D 3F2	AP3	AP	POSAP3(4),NEGAP3(4)	* CHECK C CODE FOR ZERO RESULT
001E62	47 4 0 C E6E		BC	LSZ,AP4	ADD NEGATIVE CONSTANT TO ZERO
001E66	58 4 0 D 3EE		L	R4,POSAP3	BRANCH ON NEGATIVE RESULT
001E6A	99 00 C E6A		HPR		DISPLAY ERROR TOTAL
001E6E	D2 03 D 2F4 D 3F6	AP4	MVC	WKSTG(4),POSZER	* CHECK NEGATIVE CONDITION CODE
001E74	FA 3 3 D 2F4 D 3D6		AP	WKSTG(4),POSAP2(4)	SET WORKING STORAGE TO +0
001E7A	47 2 0 C ECC		BC	GTZ,APINTS	SHOULD GIVE POSITIVE RESULT
001E7E	58 4 0 D 2F4		L	R4,WKSTG	NEXT CHECK INTERRUPTS
001E82	99 00 C E82		HPR		SET UP HALT CONDITIONS
001E86	FB 7 3 D 3FA D 402	APERR	SP	POSSP1(8),POSSP2(4)	* CHECK POSITIVE CONDITION CODE
001E8C	D5 07 D 3FA D 406		CLC	POSSP1(8),RSLTS1	TRY EXECUTING SUBTRACT DECIMAL
001E92	47 7 0 C E9A		BC	NONZ,APERR2	COMPARE WITH EXPECTED RESULT
001E96	99 00 C E96		HPR		CONTINUE ERROR ISOLATION
001E9A	F2 3 7 D 2F4 D 3AE	APERR2	PACK	WKSTG(4),PACCON(8)	* ONLY ADD DECIMAL FAILS
001EA0	58 4 0 D 2F4		L	R4,WKSTG	CHECK IF PACK INSTRUCTION OK
001EA4	59 4 0 D 3B6		C	R4,PACRES	IS RESULT CORRECT
001EA8	47 7 0 C E80		BC	NONZ,APERR3	CONTINUE FAULT ISOLATION
001EAC	99 00 C EAC		HPR		* F8=FB ERROR
001EB0	FC 7 3 D 3BA D 3C2	APERR3	MP	MULP1(8),MULP2(4)	CHECK IF MULTIPLY INST.WORKS
001EB6	D5 07 D 3BA D 3C6		CLC	MULP1(8),PRODMM	OPERANDS SHOULD BE EQUAL
001EBC	47 7 0 C EC4		BC	NONZ,FXERR2	
001EC0	99 00 C EC0		HPR		* F1=F3,F8=FB ERROR
001EC4	99 00 C EC4	FXERR2	HPR		* GENERAL FX ERROR
001EC8	99 00 C EC8	APINT	HPR		* UNEXPECTED PROGRAM INTERRUPT
001ECC	41 1 0 C EDC	APINTS	LA	R1,SP1	CHECK DECIMAL OVERFLOW
001ED0	0A 00		SVC	SRSS	
001ED2	FA 3 3 D 29C D 2A0		AP	DECNIN(4),DECONE(4)	SHOULD CREATE OVERFLOW
001ED8	99 00 C ED8		HPR		* DEC OVFL INT NOT RECEIVED
001EDC	45 2 0 D 1BC	SP1	BAL	R2,DECOFR	CHECK INTERRUPT CODE RECEIVED
001EE0	41 1 0 C F38		LA	R1,SPINT	
001EE4	0A 00		SVC	SRSS	
001EE6	FB 7 3 D 3FA D 402		SP	POSSP1(8),POSSP2(4)	BEGIN TESTING DECIMAL SUBTRACT
001EEC	D5 07 D 3FA D 406		CLC	POSSP1(8),RSLTS1	COMPARE WITH EXPECTED RESULT
001EF2	47 8 0 C EFA		BC	ZERO,SP2	CONTINUE CHECKING SUBTRACT
001EF6	99 00 C EF6		HPR		* SUBTRACT ERROR,EQUAL SIGNS
001EFA	FB 7 3 D 344 D 34C	SP2	SP	SPCON3(8),SPCON4(4)	SUBTRACT,SIGNS UNEQUAL
001F00	D5 07 D 344 D 350		CLC	SPCON3(8),SPRES2	COMPARE TO EXPECTED RESULT
001F06	47 8 0 C F0E		BC	ZERO,SP3	NEXT CHECK CONDITION CODES

001FDA	99 00 C F0A		HPR		
001F0E	FB 7 7 D 344 D 3FA	SP3	SP	SPCON3(8),POSSP1(8)	* SUBTRACT ERROR, UNEQUAL SIGNS SHOULD GIVE POSITIVE RESULT
001F14	47 2 0 C F1C		BC	GTZ,SP4	CHECK NEGATIVE CONDITION CODE
001F18	99 00 C F18		HPR		* CHECK FOR POS COND. CODE ERROR
001F1C	FB 7 7 D 344 D 3FA	SP4	SP	SPCON3(8),POSSP1(8)	SHOULD GIVE NEGATIVE RESULT
001F22	47 4 0 C F2A		BC	LSZ,SP5	CHECK ZERO CONDITION CODE
001F26	99 00 C F26		HPR		* CHECK FOR NEG COND CODE ERROR
001F2A	FB 3 3 D 34C D 34C	SP5	SP	SPCON4(4),SPCON4(4)	SHOULD GIVE ZERO RESULT
001F30	47 8 0 C F3C		BC	ZERO,SPINTS	NEXT CHECK INTERRUPTS
001F34	99 00 C F34		HPR		* CHECK FOR ZERO COND CODE ERROR
001F38	99 00 C F38	SPINT	HPR		* UNEXPECTED PROGRAM INTERRUPT
001F3C	41 1 0 C F4C	SPINTS	LA	R1,CP1	CHECK DECIMAL OVERFLOW INTER
001F40	0A 00		SVC	SRSS	
001F42	FB 3 3 D 294 D 298		SP	DCNINN(4),DCONEN(4)	SHOULD CREATE OVERFLOW
001F48	99 00 C F48		HPR		* DEC OVFL INT NOT RECEIVED
001F4C	45 2 0 D 1BC	CP1	BAL	R2,DECOFR	CHECK INTERRUPT CODE RECEIVED
001F50	41 1 0 C F80		LA	R1,CPINT	
001F54	0A 00		SVC	SRSS	
001F56	F9 7 7 D 344 D 344		CP	SPCON3(8),SPCON3(8)	BEGIN CHECKING DECIMAL COMPARE
001F5C	47 8 0 C F64		BC	ZERO,CP2	SHOULD HAVE EQUAL OPERANDS
001F60	99 00 C F60		HPR		* ERROR, CONDITION CODE FOR EQUAL
001F64	F9 7 7 D 40E D 344	CP2	CP	POSZR2(8),SPCON3(8)	OP1 GREATER THAN OP2
001F6A	47 2 0 C F72		BC	OP1HI,CP3	
001F6E	99 00 C F6E		HPR		* CONDITION CODE ERROR, OP2>OP1
001F72	F9 7 7 D 344 D 40E	CP3	CP	SPCON3(8),POSZR2(8)	OP2 GREATER THAN OP1
001F78	47 4 0 C F94		BC	OP1LO,MV01	NEXT CHECK DECIMAL MULTIPLY.
001F7C	99 00 C F7C		HPR		* CONDITION CODE ERROR, OP1>OP2
001F80	99 00 C F80	CPINT	HPR		* UNEXPECTED PROGRAM INTERRUPT
001F84	58 9 0 D 258		L	R9,LWPSW	SET UP NEW PSW'S TO
001F88	40 9 0 D 254		STH	R9,SVCPSW+4	INHIBIT BINARY AND
001F8C	40 9 0 D 09C		STH	R9,NPRPSW+4(,0)	DECIMAL OVERFLOW
001F90	40 9 0 D 08C		STH	R9,NSVPSW+4(,0)	INTERRUPTS
001F94	41 1 0 C FC2	MV01	LA	R1,MV0INT	UNEXPECTED INTERRUPT ADDRESS
001F98	0A 00		SVC	SRSS	SET UP INTERRUPT ROUTINES
001F9A	F1 5 3 D 36C D 372		MV0	MV0FFF(6),MV0FIV(4)	CHECK MOVE WITH OFFSET INST
001FA0	D5 05 D 36C D 376		CLC	MV0FFF(6),MVORS1	COMPARE TO EXPECTED RESULT
001FA6	47 8 0 C FAE		BC	EQL,MV02	CONTINUE TEST IF OK
001FAA	99 00 C FAA		HPR		* RESULT SHOULD BE 000555555F
001FAE	F1 3 3 D 36E D 37C	MV02	MV0	MV0FFF+2(4),MV0SVN(4)	
001FB4	D5 05 D 380 D 36C		CLC	MVORS2(6),MV0FFF	COMPARE TO EXPECTED RESULT
001FBA	47 8 0 C FC6		BC	EQL,UNPK1	NEXT CHECK UNPACK INSTRUCTION
001FBE	99 00 C FBE		HPR		* CHECK FOR TRUNCATION ERROR
001FC2	99 00 C FC2	MV0INT	HPR		* UNEXPECTED PROGRAM INTERRUPT
001FC6	41 1 0 D 012	UNPK1	LA	R1,UNPKNT	UNEXPECTED INTERRUPT ADDRESS

001FCA	0A 00		SVC	SRSS	SET UP INTERRUPT ROUTINES
001FCC	F3 3 1 D 388 D 38C		UNPK	UNPKWS(4),UNPK7F(2)	CHECK UNPACK INSTRUCTION
001FD2	05 03 D 388 D 38E		CLC	UNPKWS(4),UPKRS1	COMPARE TO EXPECTED RESULT
001FD8	47 8 0 C FE4		BC	EQL,UNPK2	CONTINUE TO TEST IF OK
001FDC	58 4 0 D 388		L	R4,UNPKWS	SET UP ERROR CONDITIONS
001FE0	99 00 C FE0		HPR		• RESULT SHOULD EQUAL 00F7F7F7
001FE4	F3 3 1 D 388 D 392	UNPK2	UNPK	UNPKWS(4),UNPK7D(2)	CHECK LOW ORDER SIGN DIFFERENT
001FEA	05 03 D 388 D 394		CLC	UNPKWS(4),UPKPS2	COMPARE TO EXPECTED RESULT
001FF0	47 8 0 C FF8		BC	EQL,UNPK3	
001FF4	99 00 C FF4		HPR		• LOW ORDER SIGN ERROR
001FF8	0A 0A	UNPK3	SVC	ASCCD	CHECK ASCII SIGN GENERATION
001FFA	F3 3 1 D 388 D 398		UNPK	UNPKWS(4),UNPKAS(2)	
002000	05 03 D 388 D 39A		CLC	UNPKWS(4),UPKAS1	COMPARE TO EXPECTED RESULT
002006	47 8 0 D 016		BC	EQL,PACK1	NEXT CHECK PACK INSTRUCTION
00200A	58 4 0 D 388		L	R4,UNPKWS	DISPLAY ERROR CONDITIONS
00200E	99 00 D 00E		HPR		• ASCII SIGN GENERATION ERROR
002012	99 00 D 012	UNPKNT	HPR		• UNEXPECTED PROGRAM INTERRUPT
002016	41 1 0 D 034	PACK1	LA	R1,PACKNT	UNEXPECTED INTERRUPT ADDRESS
00201A	0A 00		SVC	SRSS	SET UP INTERRUPT ROUTINES
00201C	F2 1 3 D 388 D 394		PACK	UNPKWS(2),UPKPS2(4)	UNPACK WORKS, TRY PACK INST
002022	05 01 D 388 D 392		CLC	UNPKWS(2),UNPK7D	RESULT SHOULD EQUAL 777D
002028	47 8 0 D 038		BC	EQL,MP1	NEXT CHECK EDIT INST
00202C	48 4 0 D 388		LH	R4,UNPKWS	SET UP ERROR CONDITIONS
002030	99 00 D 030		HPR		• RESULT SHOULD EQUAL 777D
002034	99 00 D 034	PACKNT	HPR		• UNEXPECTED PROGRAM INTERRUPT
002038	41 1 0 D 086	MP1	LA	R1,MPINT	TEST MULTIPLY DECIMAL INST
00203C	0A 00		SVC	SRSS	
00203E	FC 3 1 D 416 D 41A		MP	MPOSZ1(4),MPOSZ2(2)	PLUS ZERO TIMES PLUS ZERO
002044	05 03 D 416 D 41C		CLC	MPOSZ1(4),MPRES1	RESULT SHOULD BE POSITIVE ZERO
00204A	47 8 0 D 052		BC	EQL,MP2	CONTINUE MULTIPLY TEST
00204E	99 00 D 04E		HPR		• +0 TIMES +0 NOT EQUAL +0
002052	FC 3 1 D 416 D 420	MP2	MP	MPOSZ1(4),MNEGZ1(2)	PLUS ZERO TIMES MINUS ZERO
002058	05 03 D 416 D 422		CLC	MPOSZ1(4),MPRES2	RESULT SHOULD BE NEGATIVE ZERO
00205E	47 8 0 D 066		BC	EQL,MP3	CONTINUE MULTIPLY TEST
002062	99 00 D 062		HPR		• +0 TIMES -0 NOT EQUAL -0
002066	FC 3 1 D 426 D 42A	MP3	MP	MPCON1(4),MPCON2(2)	MULTIPLY ONE TIMES 15
00206C	05 03 D 426 D 42C		CLC	MPCON1(4),MPRES3	ONE PASS CHECKED
002072	47 8 0 D 07A		BC	EQL,MP4	
002076	99 00 D 076		HPR		• ONE TIMES 15 NOT EQUAL 15
00207A	FC 5 1 D 430 D 436	MP4	MP	MPCON3(6),MPCON4(2)	CHECK MORE THAN ONE PASS
002080	05 05 D 430 D 438		CLC	MPCON3(6),MPRES4	12 TIMES 12 SHOULD EQUAL 144
002086	47 8 0 D 08E		BC	EQL,MP5	
00208A	99 00 D 08A		HPR		• MULTIPLY ERROR, TWO PASSES
00208E	FC 7 3 D 43E D 446	MP5	MP	MPCON5(8),MPCON6(4)	MULTIPLY 10001 TIMES 10001

002094	D5 07 D 43E D 44A		CLC	MPCON5(8),MPRES5	RESULT SHOULD BE 100020001
00209A	47 8 0 D 0A2		BC	EQL,MP6	
00209E	99 00 D 09E		HPR		* CHECK ZEROS IN TOTAL
0020A2	FC 7 3 D 452 D 45A	MP6	MP	MPCON7(8),MPCON8(4)	CHECK DECIMAL CORRECTION
0020A8	D5 07 D 452 D 45E		CLC	MPCON7(8),MPRES6	
0020AE	47 8 0 D 0BA		BC	EQL,DP1	
0020B2	99 00 D 0B2		HPR		* MULTIPLY DEC CORRECT ERROR
0020B6	99 00 D 0B6	MPINT	HPR		* UNEXPECTED PROGRAM INTERRUPT
0020BA	41 1 0 D 1A0	DP1	LA	R1,DPINT	UNEXPECTED INTERRUPT ADDRESS
0020BE	0A 00		SVC	SRSS	
0020C0	FD 2 0 D 466 D 469		DP	DVDND1(3),DVSOR1(1)	DIVIDE PLUS 8 BY ONE
0020C6	D5 02 D 466 D 46A		CLC	DVDND1(3),QUOTR1	RESULT SHOULD EQUAL PLUS 8
0020CC	47 8 0 D 0D4		BC	EQL,DP2	
0020D0	99 00 D 0D0		HPR		* DIVIDE NUMBER BY ONE FAILS
0020D4	FD 2 0 D 46D D 470	DP2	DP	DVDND2(3),DVSOR2(1)	DIVIDE EVEN NUMBER BY TWO
0020DA	D5 02 D 46D D 471		CLC	DVDND2(3),QUOTR2	6 DIVIDED BY 2 SHOULD EQUAL 3
0020E0	47 8 0 D 0E8		BC	EQL,DP3	
0020E4	99 00 D 0E4		HPR		* EVEN NR. DIVIDED BY 2 FAILS
0020E8	FD 2 0 D 474 D 477	DP3	DP	DVDND3(3),DVSOR3(1)	DIVIDE ODD NUMBER BY TWO
0020EE	D5 02 D 474 D 478		CLC	DVDND3(3),QUOTR3	SHOULD HAVE REMAINDER OF ONE
0020F4	47 8 0 D 0FC		BC	EQL,DP4	
0020F8	99 00 D 0F8		HPR		* ODD NR. DIVIDED BY TWO FAILS
0020FC	FD 5 2 D 47B D 481	DP4	DP	DVDND4(6),DVSOR4(3)	DIVIDE NUMBER BY ITSELF
002102	D5 05 D 47B D 484		CLC	DVDND4(6),QUOTR4	COMPARE TO EXPECTED RESULT
002108	47 8 0 D 110		BC	EQL,DP5	
00210C	99 00 D 10C		HPR		* 4 DIG. NR. DIVIDED BY SELF ERR.
002110	FD 5 2 D 48A D 490	DP5	DP	DVDND5(6),DVSOR5(3)	DIVIDE 8888 BY 4444
002116	D5 05 D 48A D 493		CLC	DVDND5(6),QUOTR5	ANSWER SHOULD EQUAL 02
00211C	47 8 0 D 124		BC	EQL,DP6	
002120	99 00 D 120		HPR		* ERROR, >1 DIGIT AND PASS
002124	FD 4 1 D 499 D 49E	DP6	DP	DVDND6(5),DVSOR6(2)	DIVIDE 8888 BY 4
00212A	D5 04 D 499 D 4A0		CLC	DVDND6(5),QUOTR6	RESULT SHOULD EQUAL 2222
002130	47 8 0 D 138		BC	EQL,DP7	
002134	99 00 D 134		HPR		* DIVIDE 8888 BY 4 FAILS
002138	FD 2 0 D 4A5 D 4A8	DP7	DP	DVDND7(3),DVSOR7(1)	DIVIDE WITH DECIMAL CORRECTION
00213E	D5 02 D 4A5 D 4A9		CLC	DVDND7(3),QUOTR7	16 DIVIDED BY 8 SHOULD EQL 2
002144	47 8 0 D 14C		BC	EQL,DP8	
002148	99 00 D 148		HPR		* DECIMAL CORRECTION FAILURE
00214C	FD 4 0 D 4AC D 4B1	DP8	DP	DVDND8(5),DVSOR8(1)	DIVIDE 800008 BY 8
002152	D5 04 D 4AC D 4B2		CLC	DVDND8(5),QUOTR8	RESULT SHOULD EQUAL 100001
002158	47 8 0 D 160		BC	EQL,DP9	
00215C	99 00 D 15C		HPR		* ZERO PROPAGATION FAILURE
002160	FD 8 2 D 4B7 D 4C0	DP9	DP	DVDND9(9),DVSOR9(3)	TRY COMPLEX DIVISION
002166	D5 08 D 4B7 D 4C3		CLC	DVDND9(9),QUOTR9	

00216C	47 8 0 D 174		BC	EQL,DPA	
002170	99 00 D 170		HPR		• FINAL DIVISION ERROR
002174	41 1 0 D 184	DPA	LA	R1,DPB	TEST DECIMAL DIVIDE EXCEPTION
002178	0A 00		SVC	SRSS	
00217A	FD 2 0 D 4CC D 4CF		DP	DVDNDA(3),DVSORA(1)	DIVIDE BY ZERO
002180	99 00 D 180		HPR		• DECIMAL DIVIDE FAULT ERROR
002184	45 2 0 D 1CC	DPB	BAL	R2,DECDFR	CHECK INTERRUPT CODE RECEIVED
002188	41 1 0 D 198		LA	R1,DPD	SET NEW INTERRUPT LOCATION
00218C	0A 00		SVC	SRSS	
00218E	FD 0 0 D 4D0 D 4D1		DP	DVDNDC(1),DVSORC(1)	CREATE DECIMAL DIVIDE FAULT
002194	99 00 D 194		HPR		• DEC DIVIDE FAULT FOR LENGTH ERR
002198	45 2 0 D 1CC	DPD	BAL	R2,DECDFR	CHECK INTERRUPT CODE
00219C	47 F 0 D 600		BC	15,LHTEST	CONTINUE TO NEXT TEST
0021A0	99 00 D 1A0	DPINT	HPR		• UNEXPECTED PROGRAM INTERRUPT
0021A4	41 A 0 0 050	ADDEXR	LA	R10,80(,0)	LOAD R10 WITH ADDRESSING EXCEP
0021A8	47 F 0 0 1D0		BC	UNCOND,CHKINC	CHECK FOR CORRECT CODE
0021AC	41 A 0 0 060	SPECIR	LA	R10,96(,0)	LOAD R10 WITH SPEC. EXCEPTION
0021B0	47 F 0 0 1D0		BC	UNCOND,CHKINC	CHECK FOR CORRECT CODE
0021B4	41 A 0 0 080	BINOFB	LA	R10,128(,0)	LOAD R10 WITH BINARY OVFLW CODE
0021B8	47 F 0 0 1D0		BC	UNCOND,CHKINC	CHECK FOR CORRECT CODE
0021BC	41 A 0 0 0A0	DECOFR	LA	R10,160(,0)	LOAD R10 WITH DECIMAL OVFLW CD
0021C0	47 F 0 0 1D0		BC	UNCOND,CHKINC	CHECK FOR CORRECT CODE
0021C4	41 A 0 0 020	POEXR	LA	R10,32(,0)	LOAD R10 W/ PRIVILEGED OPERAT'N
0021C8	47 F 0 0 1D0		BC	UNCOND,CHKINC	CHECK FOR CORRECT CODE
0021CC	41 A 0 0 080	DECDFR	LA	R10,176(,0)	LOAD R10 WITH DEC. DIV. EXCEPT.
0021D0	58 9 0 0 018	CHKINC	L	R9,OPRPSW(,0)	LOAD R9 WITH OLD PROGRAM PSW
0021D4	54 9 0 0 210		N	R9,INCMASK	CLEAR ALL BUT INTERRUPT CODE
0021D8	19 9 A		CR	R9,R10	IS INTERRUPT CODE CORRECT?
0021DA	47 8 0 D 1E2		BC	EQL,CHKD	IF EQUAL SKIP HALT
0021DE	99 00 2 000		HPR	0(R2)	• DISPLAY RETURN ADDRESS
0021E2	07 F 2	CHKD	BCR	UNCOND,R2	RETURN TO CONTINUE DMR
0021E4	99 00 D 1E4	MUXIN	HPR		• INCORRECT MUX CHANNEL INTERRUPT
0021E8	99 00 D 1E8	SEL1IN	HPR		• INCORRECT SELECTOR 1 INTERRUPT
0021EC	99 00 D 1EC	SEL2IN	HPR		• INCORRECT SELECTOR 2 INTERRUPT
0021F0	00000000	ILLINST	DC	F'0'	
0021F4	20000000	TWOO	DC	X'20000000'	
0021F8	A0000000		DC	X'A0000000'	
0021FC	C0000000	CO	DC	X'C0000000'	
002200	0F000000		DC	X'0F000000'	
002204	00000020	TWENTY	DC	X'00000020'	CONSTANT FOR INTERRUPT CODE CHK
002208	00000050	FIFTY	DC	X'00000050'	CONSTANT FOR INTERRUPT CODE CHK
00220C	00000060	SIXTY	DC	X'00000060'	
002210	000000FF	INCMASK	DC	X'000000FF'	
002214	00000C00	COO	DC	X'00000C00'	

002218	0000FF00	INMSKU	DC	X'0000FF00'
00221C	0001FFFF	ADRM SK	DC	X'0001FFFF'
002220	0C000000	ZEROC	DC	X'0C000000'
002224	30000000	THREE0	DC	X'30000000'
002228	3F000000	THREEF	DC	X'3F000000'
00222C	40000000	FOURO	DC	X'40000000'
002230	80000000	EIGHT0	DC	X'80000000'
002234	FE000000	FE	DC	X'FE000000'
		CNOP		0,8
002238	00000000	NEWPSW	DC	F'0'
00223C	0000131C		DC	A(LPSW1)
002240	7E0B0000	UPPSW	DC	X'7E0B0000'
002244	3C00		DC	X'3C00'
002246	134E		DC	Y(LPSW5)
002248	02000000	NWPSW	DC	X'02000000'
00224C	00001396		DC	A(LPSW10)
002250	00000000	SVCPSW	DC	2F'0'
	00000000			
002258	3C000000	LWPSW	DC	X'3C000000'
00225C	02010000	PISRPS	DC	X'02010000'
002260	00000200	HEX200	DC	X'00000200'
002264	00000202	HEX202	DC	X'00000202'
002268	7E000000	X7E	DC	X'7E000000'
00226C	00000010	TEN10	DC	X'00000010'
002270	80000000	X80	DC	X'80000000'
002274	A5	TMSKAS	DC	X'A5'
002275	5A	TMSK5A	DC	X'5A'
002276	0000			
002278	000014E4	ERRAD1	DC	A(BALER1)
00227C	00001554	ERRAD2	DC	A(BALRER)
002280	0000154C	BALRAD	DC	A(BALRSB)
002284	0000102C	BCTAD1	DC	A(BCTER1)
002288	0000106C	BCTAD2	DC	A(BCTR2)
00228C	00001056	BCTAD3	DC	A(BCTR2A)
002290	40000000	BOFCON	DC	X'40000000'
002294	9999999D	DCNINN	DC	X'9999999D'
002298	0000001C	DCONEN	DC	X'0000001C'
00229C	9999999C	DECNIN	DC	X'9999999C'
0022A0	0000001C	DECONE	DC	X'0000001C'
0022A4	00040000	STCON1	DC	X'00040000'
0022A8	04000000	STCON3	DC	X'04000000'
0022AC	FF000000	STCON2	DC	X'FF000000'
0022B0	000000FF	ICCON	DC	X'000000FF'
0022B4	00FF0000	MVICON	DC	X'00FF0000'

PSW FOR SUPERVISOR CALL ROUTINE

CONSTANT OF 200
CONSTANT OF 202

HEXADECIMAL CONSTANT OF 10

002288	FF00FFFF	MVICN2	DC	X'FF00FFFF'
0022BC	00FFFFFF	MVICN3	DC	X'00FFFFFF'
0022C0	00010000	AICON1	DC	X'00010000'
0022C4	01010000	AICON2	DC	X'01010000'
0022C8	02000000	AICON3	DC	X'02000000'
0022CC	FFFF0000	AICON4	DC	X'FFFF0000'
0022D0	01000000	AICON5	DC	X'01000000'
0022D4	00020000	AICON6	DC	X'00020000'
0022D8	00000000	MVZERO	DC	X'00000000'
0022DC	FFFFFFFF	MVONES	DC	X'FFFFFFFF'
0022E0	0F0F0F0F	ZEROFF	DC	X'0F0F0F0F'
0022E4	0F0F0F0F	ZEROF2	DC	X'0F0F0F0F'
0022E8	F0F0F0F0	FFZERO	DC	X'F0F0F0F0'
0022EC	00000000	ZEROS	DC	X'00000000'
0022F0	FFFFFFFF	MINUS1	DC	X'FFFFFFFF'
0022F4	00000000	WKSTG	DC	X'00000000'
0022F8	FFFF0000	XCARI	DC	X'FFFF0000'
0022FC	FF00FF00	XCAR2	DC	X'FF00FF00'
002300	00FFFFFF	XCAR3	DC	X'00FFFFFF'
002304	00000003	CONTHR	DC	X'00000003'
002308	00000001	CONONE	DC	X'00000001'
00230C	00000009	SRLCNT	DC	X'00000009'
002310	007FFFFFFF	NEWCON	DC	X'007FFFFFFF'
002314	0000008C	EGT	DC	X'0000008C'
002318	0000002C	TWOCON	DC	X'0000002C'
00231C	0000010C	TENDEC	DC	X'0000010C'
002320	0000	HPONES	DC	X'0000'
002322	7FFF	HPONEA	DC	X'7FFF'
002324	0000FFFF	SXONES	DC	X'0000FFFF'
002328	5555AAAA	ZERONE	DC	X'5555AAAA'
00232C	00000000	EXTRA	DC	X'00000000'
002330	00	EVNBYT	DC	X'00'
002331	000000	ODDBYT	DC	X'000000'
002334	00000000	WRKSTG	DC	X'00000000'
002338	7FFF0000	HWPCON	DC	X'7FFF0000'
00233C	00007FFF	WPCON	DC	X'00007FFF'
	000004	LESS	EQU	4
	000002	MORE	EQU	2
002340	80000010	MINSTN	DC	X'80000010'
002344	00000064 2753198C	SPCON3	DC	X'000000642753198C'
00234C	8142758D	SPCON4	DC	X'8142758D'
002350	00000065 0895956C	SPRES2	DC	X'000000650895956C'
002358	4372913C	ZAPCN1	DC	X'4372913C'
00235C	3405664D	ZAPCN2	DC	X'3405664D'

EBCDIC CONSTANT TO TEST ZAP

002360	5631024D	NEGZAP	DC	X'5631024D'	NEGATIVE EBCDIC CONSTANT
002364	0543278C	POSZAP	DC	X'0543278C'	POSITIVE EBCDIC CONSTANT
002368	7FFFFFFF	WW7F	DC	X'7FFFFFFF'	
00236C	FFFFFFFF FFFF	MVOFFF	DC	X'FFFFFFFFFFFF'	
002372	55555555	MVOFIV	DC	X'55555555'	
002376	00055555 555F	MVORS1	DC	X'00055555555F'	
00237C	77777777	MVOSVN	DC	X'77777777'	
002380	00057777 777F0000	MVORS2	DC	X'0005777777F0000'	
002388	00000000	UNPKW5	DC	X'00000000'	
00238C	777F	UNPK7F	DC	X'777F'	
00238E	F0F7F7F7	UPKRS1	DC	X'F0F7F7F7'	
002392	777D	UNPK7D	DC	X'777D'	
002394	F0F7F7D7	UPKPS2	DC	X'F0F7F7D7'	
002398	777B	UNPKAS	DC	X'777B'	
00239A	303737B7	UPKAS1	DC	X'303737B7'	
	00000A	ASCCD	EQU	10	
00239E	0C000000	INTMSK	DC	X'0C000000'	
0023A2	2512706C	ADSTG	DC	X'2512706C'	
0023A6	0696543C	ADSTG2	DC	X'0696543C'	
0023AA	3209249C	ADANS	DC	X'3209249C'	DECIMAL RESULT OF ADDITION
0023AE	C0C3C6C9 C2C4C8C7	PACCON	DC	X'C0C3C6C9C2C4C8C7'	PACKED RESULT OF PACCON
0023B6	3692487C	PACRES	DC	X'3692487C'	
0023BA	00000000 0000032C	MULP1	DC	X'000000000000032C'	
0023C2	0000016C	MULP2	DC	X'0000016C'	
0023C6	00000000 0000512C	PRODMH	DC	X'000000000000512C'	
0023CE	00000000 0236184C	POSAP1	DC	X'000000000236184C'	
0023D6	1264345C	POSAP2	DC	X'1264345C'	
0023DA	00000000 1500529C	POSRES	DC	X'000000001500529C'	
0023E2	6304650D	NEGAP1	DC	X'6304650D'	
0023E6	00000000 4804121D	NEGRES	DC	X'000000004804121D'	
0023EE	0641923C	POSAP3	DC	X'0641923C'	
0023F2	0641923D	NEGAP3	DC	X'0641923D'	
0023F6	0000000C	POSZER	DC	X'0000000C'	
0023FA	00000061 5082364C	POSSP1	DC	X'000000615082364C'	
002402	2369015C	POSSP2	DC	X'2369015C'	
002406	00000061 2713349C	RLTS1	DC	X'000000612713349C'	
00240E	00000000 0000000C	POSZR2	DC	X'000000000000000C'	
002416	0000000C	MPOSZ1	DC	X'0000000C'	
00241A	000C	MPOSZ2	DC	X'000C'	
00241C	0000000C	MPRES1	DC	X'0000000C'	
002420	000D	MNEGZ1	DC	X'000D'	
002422	0000000D	MPRES2	DC	X'0000000D'	
002426	0000001C	MPCON1	DC	X'0000001C'	
00242A	015C	MPCON2	DC	X'015C'	

00242C	0000015C	MPRES3	DC	X'0000015C'
002430	00000000 012C	MPCON3	DC	X'00000000012C'
002436	012C	MPCON4	DC	X'012C'
002438	00000000 144C	MPRES4	DC	X'00000000144C'
00243E	00000000 0010001C	MPCON5	DC	X'00000000010001C'
002446	0010001C	MPCON6	DC	X'0010001C'
00244A	00000010 0020001C	MPRES5	DC	X'000000100020001C'
002452	00000000 0009999C	MPCON7	DC	X'000000000009999C'
00245A	0009999C	MPCON8	DC	X'0009999C'
00245E	00000009 9980001C	MPRES6	DC	X'000000099980001C'
002466	00008C	DVDND1	DC	X'00008C'
002469	1C	DVSOR1	DC	X'1C'
00246A	008C0C	QUOTR1	DC	X'008C0C'
00246D	00006C	DVDND2	DC	X'00006C'
002470	2C	DVSOR2	DC	X'2C'
002471	003C0C	QUOTR2	DC	X'003C0C'
002474	00007C	DVDND3	DC	X'00007C'
002477	2C	DVSOR3	DC	X'2C'
002478	003C1C	QUOTR3	DC	X'003C1C'
00247B	00000004 231C	DVDND4	DC	X'00000004231C'
002481	04231C	DVSOR4	DC	X'04231C'
002484	00001C00 000C	QUOTR4	DC	X'00001C00000C'
00248A	00000008 888C	DVDND5	DC	X'00000008888C'
002490	04444C	DVSOR5	DC	X'04444C'
002493	00002C00 000C	QUOTR5	DC	X'00002C00000C'
002499	00000888 8C	DVDND6	DC	X'000008888C'
00249E	004C	DVSOR6	DC	X'004C'
0024A0	02222C00 0C	QUOTR6	DC	X'02222C000C'
0024A5	00016C	DVDND7	DC	X'00016C'
0024A8	8C	DVSOR7	DC	X'8C'
0024A9	002C0C	QUOTR7	DC	X'002C0C'
0024AC	00080000 8C	DVDND8	DC	X'000800008C'
0024B1	8C	DVSOR8	DC	X'8C'
0024B2	0100001C 0C	QUOTR8	DC	X'0100001C0C'
0024B7	00000000 98017432	DVDND9	DC	X'0000000098017432'
0024BF	6C		DC	X'6C'
0024C0	05236C	DVSOR9	DC	X'05236C'
0024C3	00000187 199C0036	QUOTR9	DC	X'00000187199C0036'
0024CB	2C		DC	X'2C'
0024CC	00001C	DVDNDA	DC	X'00001C'
0024CF	0C	DVSORA	DC	X'0C'
0024D0	1C	DVDNDC	DC	X'1C'
0024D1	1C	DVSORC	DC	X'1C'
0024D2	00000000	TRCON1	DC	X'00000000'

0024D6	FF000000	00000000	TRTBL1	DC	X'FF00000000000000'	
0024DE	04010302		TRCON2	DC	X'04010302'	
0024E2	0F0E0D0C	0B0A0908	TRTBLE	DC	X'0F0E0D0C0B0A0908'	
0024EA	07060504	03020100		DC	X'0706050403020100'	
0024F2	0B0E0C0D		TRRES2	DC	X'0B0E0C0D'	
0024F6	00010203	04050607	TRCON3	DC	X'0001020304050607'	
0024FE	08090A0B	0C0D0E0F		DC	X'08090A0B0C0D0E0F'	
002506	1384792C		EDFLD1	DC	X'1384792C'	
00250A	40202020	20202020	EDMSK1	DC	X'4020202020202020'	
002512	40F1F3F8	F4F7F9F2	EDRES1	DC	X'40F1F3F8F4F7F9F2'	
00251A	0000000C		EDFLD2	DC	X'0000000C'	
00251E	40202020	20202020	EDMSK2	DC	X'4020202020202020'	
002526	40404040	40404040	EDRES2	DC	X'4040404040404040'	
00252E	0000400C		EDFLD3	DC	X'0000400C'	
002532	40202020	20202020	EDMSK3	DC	X'4020202020202020'	
00253A	40404040	40F4F0F0	EDRES3	DC	X'4040404040F4F0F0'	
002542	0000000C		EDFLD4	DC	X'0000000C'	
002546	40202020	20212020	EDMSK4	DC	X'4020202020212020'	
00254E	40404040	4040F0F0	EDRES4	DC	X'404040404040F0F0'	
002556	00200200		EDFLD5	DC	X'00200200'	
00255A	40202020	22212020	EDMSK5	DC	X'4020202022212020'	
002562	404040F2	4040F0F2	EDRES5	DC	X'404040F24040F0F2'	
00256A	71325C		EDFLD6	DC	X'71325C'	
00256D	40202020	C5C4C9E3	EDMSK6	DC	X'40202020C5C4C9E3'	
002575	2020			DC	X'2020'	
002577	40F7F1F3	C5C4C9E3	EDRES6	DC	X'40F7F1F3C5C4C9E3'	
00257F	F2F5			DC	X'F2F5'	
002581	00023C		EDFLD7	DC	X'00023C'	
002584	405B2020	214B2020	EDMSK7	DC	X'405B2020214B2020'	
00258C	40404040	404BF2F3	EDRES7	DC	X'40404040404BF2F3'	
002594	06789D		EDFLD8	DC	X'06789D'	
002597	40202020	2020C3D9	EDMSK8	DC	X'402020202020C3D9'	
00259F	4040F6F7	F8F9C3D9	EDRES8	DC	X'4040F6F7F8F9C3D9'	
0025A7	06789C		EDFLD9	DC	X'06789C'	
0025AA	40202020	2020C3D9	EDMSK9	DC	X'402020202020C3D9'	
0025B2	4040F6F7	F8F94040	EDRES9	DC	X'4040F6F7F8F94040'	
0025BA	40202020	2020	EDCCM1	DC	X'402020202020'	
0025C0	40202020	2020	EDCCM2	DC	X'402020202020'	
0025C6	40202C20	2020	EDCCM3	DC	X'40202C202020'	
0025CC	00000000		ALLOS	DC	F'0'	FULL WORD = 00000000 FOR LM CHK
0025D0	11111111		ALL15	DC	X'11111111'	FULL WORD = 11111111 FOR LM CHK
0025D4	22222222		ALL25	DC	X'22222222'	FULL WORD = 22222222 FOR LM CHK
0025D8	33333333		ALL35	DC	X'33333333'	FULL WORD = 33333333 FOR LM CHK
0025DC	AAAAAAAA		ALL45	DC	X'AAAAAAAAA'	FULL WORD = AAAAAAAAAA FOR LM CHK

0025E0	BBBBBBBB	ALLBS	DC	X'BBBBBBBB'	FULL WORD = BBBBBBBB FOR LM CHK
0025E4	CCCCCCCC	ALLCS	DC	X'CCCCCCCC'	FULL WORD = CCCCCCCC FOR LM CHK
0025E8	00000000	STMBUF	DC	4F'0000000'	STORAGE FOR R12-R15 FOR LM CHK
	00000000				
	00000000				
	00000000				
0025F8	DDDDDDDD	ALLDS	DC	X'DDDDDDDD'	FULL WORD = DDDDDDDD FOR LM CHK
0025FC	EEEEEEEE	ALLES	DC	X'EEEEEEEE'	FULL WORD = EEEEEEEE FOR LM CHK
002600	41 1 0 D 668	LMTEST	LA	R1,LMADR3	GET UNEXPECTED INTERRUPT PSW
002604	0A 03		SVC	PRPS	PROBLEM REGISTERS/STATE
002606	58 1 0 D 5CC		L	R1,ALLOS	SETUP FOR LM R1,R3,ALLDS
00260A	58 4 0 D 5D0		L	R4,ALL1S	SET R3,R4,R5 TO ALLDS=ALL2S
00260E	58 5 0 D 5D4		L	R5,ALL2S	SET R1,R2,R3 SO LM CHANGES
002612	18 0 5		LR	R0,R5	THE CONTENTS OF EACH REG
002614	18 2 4		LR	R2,R4	
002616	12 3 1		LTR	R3,R1	
002618	98 0 2 D 5CC	LMCC	LM	R0,R2,ALLOS	SET CONDITION CODE TO ZERO
00261C	47 7 0 D 694		BC	NONZ,LMCCO	TRY FIRST LM INSTRUCTION
002620	19 0 3		CR	R0,R3	CONDITION CODE SHOULDN'T CHANGE
002622	47 7 0 D 664		BC	NEQ,LMERR1	R0 SHOULD BE 00000000 NOW
002626	19 1 4		CR	R1,R4	NOT. ERROR EXIT
002628	47 7 0 D 660		BC	NEQ,LMERR2	R1 SHOULD BE 11111111 NOW
00262C	19 2 5		CR	R2,R5	NOT. ERROR EXIT
00262E	47 7 0 D 660		BC	NEQ,LMERR2	R2 SHOULD BE 22222222 NOW
002632	50 C 0 D 5E8		ST	R12,STMBUF+00	NOT. ERROR EXIT
002636	50 D 0 D 5EC		ST	R13,STMBUF+04	
00263A	50 E 0 D 5F0		ST	R14,STMBUF+08	THESE WILL BE USED TO CHECK
00263E	50 F 0 D 5F4		ST	R15,STMBUF+12	REGISTER WRAP-AROUND ON
002642	98 C 1 D 5E8		LM	R12,R1,STMBUF	LM R12,R1,STMBUF
002646	59 0 0 D 5F8		C	R0,ALLDS	
00264A	47 7 0 D 66C		BC	NEQ,NOWRAP	R0 SHOULD BE DDDDDDDD
00264E	41 1 0 D 6B8	LMADR1	LA	R1,STMTST	BRANCH IF WRAP DIDNT WORK.
002652	0A 00		SVC	SRSS	PSW SWAP ADR ; FOR END OF LM
002654	98 2 2 D 5CD		LM	R2,R2,ALLOS+1	SUPERVISOR REGISTERS/STATE
002658	99 00 2 000	LMSPC1	HPR	0(R2)	TRY LM ACROSS BYTE BOUND
00265C	47 F 0 D 6B8		BC	15,STMTST	* NO SPECIFICATION INTERRUPT
002660	99 00 2 000	LMERR2	HPR	0(R2)	EXIT NOW ; DONE WITH LM
002664	99 00 0 000	LMERR1	HPR	0(R0)	* LM REPEAT DIDNT WORK
002668	99 00 0 000	LMADR3	HPR	0(R0)	* LM DIDNT LOAD FIRST REGISTER
00266C	59 C 0 D 5E8	NOWRAP	C	R12,STMBUF	* UNEXPECTED INTERRUPT DURING LM
002670	47 7 0 D 688		BC	NEQ,WRAP1	LM WRAP DIDNT WORK ; WHY
002674	59 F 0 D 5F4		C	R15,STMBUF+12	FIRST REG LOADED?
002678	47 7 0 D 68C		BC	NEQ,WRAP2	YES. R15 LOADED?
00267C	59 0 0 D 5F8		C	R0,STMBUF+16	BRANCH IF NOT
					WRAP FROM R15=R0

```

002680 47 7 0 D 690
002684 99 00 1 000
002688 99 00 C 000
00268C 99 00 F 000
002690 99 00 0 000
002694 99 00 0 000
002698 58 4 0 D 5CC
00269C 12 4 4
00269E 18 3 4
0026A0 58 1 0 D 5F8
0026A4 50 1 0 D 5E8
0026A8 50 1 0 D 5EC
0026AC 50 1 0 D 5F0
0026B0 50 1 0 D 5F4
0026B4 47 F 0 2 000
0026B8 41 1 0 D 72E
0026BC 0A 00
0026BE 45 2 0 D 698
0026C2 98 0 3 D 5CC
0026C6 90 0 3 D 5E8
0026CA 47 8 0 D 6D2
0026CE 99 00 D 6CE
0026D2 59 0 0 D 5E8
0026D6 47 8 0 D 6DE
0026DA 99 00 D 6DA
0026DE 59 3 0 D 5F4
0026E2 47 8 0 D 6EA
0026E6 99 00 D 6E6
0026EA 45 2 0 D 698
0026EE 90 F 2 D 5E8
0026F2 59 F 0 D 5E8
0026F6 47 8 0 D 6FE
0026FA 99 00 D 6FA
0026FE 59 2 0 D 5F4
002702 47 8 0 D 716
002706 59 0 0 D 5EC
00270A 47 8 0 D 712
00270E 99 00 D 70E
002712 99 00 D 712
002716 41 1 0 D 726
00271A 0A 01
00271C 90 1 1 D 5E9
002720 0A 00
002722 99 00 D 722

```

```

WRAP1
WRAP2
WRAP3
LMCCO
BUFDDO

```

STMTST

STM01

STM02

STM03

STM04

STM05

STM06

```

BC      NEQ,WRAP3
HPR     O(R1)
HPR     O(R12)
HPR     O(R15)
HPR     O(R0)
HPR     O(R0)
L       R4,ALLOS
LTR     R4,R4
LR      R3,R4
L       R1,ALLDS
ST      R1,STMBUF+00
ST      R1,STMBUF+04
ST      R1,STMBUF+8
ST      R1,STMBUF+12
BC      15,0(,R2)
LA      R1,STMER1
SVC     SRSS
BAL     R2,BUFDDO
LM      R0,R3,ALLOS
STM     R0,R3,STMBUF
BC      8,STM01
HPR     C
C       R0,STMBUF
BC      8,STM02
HPR     C
C       R3,STMBUF+12
BC      8,STM03
HPR     BAL
BAL     R2,BUFDDO
STM     R15,R2,STMBUF
C       R15,STMBUF
BC      8,STM04
HPR     C
C       R2,STMBUF+12
BC      8,STM06
C       R0,STMBUF+4
BC      8,STM05
HPR     HPR
LA      R1,STM07
SVC     SRPS
STM     R1,R1,STMBUF+1
SVC     0
HPR

```

- ```

 BRANCH IF R0 NOT LOADED
• LM LOADED R12=R0, NOT R1
• LM DIDNT LOAD FIRST REG=R12
• LM DIDNT LOAD R15
• LM LOADED R15, BUT NOT R0
• LM CHANGED CONDITION CODE
 CLEAR CC/SET STMBUF=STMBUF+12-
 ... TO ALL D (DDDDDDDD)
 CC = 00 NOW
 R1 = DDDDDDDD
 * * * * *
 • SETUP BUFFER FOR STM
 • INSTRUCTION CHECKOUT
 * * * * *
 EXIT BACK TO STMTST
 GET UNEXPECTED INT PSW SET UP
 SUPERVISOR STATE NOW
 SETUP BUFFER TO KNOWN PATTERN
 PICKUP DATA
 TRY FIRST STM
 BRANCH IF CC CHANGED
• STM CHANGED CC
 CHECK FIRST REG STORED VS DATA
 BRANCH IF DATA STORED OK
• R0 DIDNT STORE DURING STM
 CHECK IF LAST REG STORED OK
 BRANCH IF ALL OK
• REPEAT DIDNT WORK FOR STM R0=R3
 SETUP STMBUF FOR NEXT CHECK
 TRY STM R15,R0,R1,R2 TO BUF
 WAS R15 STORED OK?
 BRANCH IF OK
• R15 NOT STORED AS FIRST IN STM
 WAS R2 STORED OK?
 BRANCH IF OK
 R2 NOTSTORED RIGHT! WAS R0?
 BRANCH IF R0 STORED OK
• STM DIDNT STORE R0 OR R2
• STM STORED R0, BUT NOT R2
 SETUP SPECIFICATION IN? CHECK
 SUPV REG, PROBLEM STATE
 TRY FOR SPEC INT
 SUPERVISOR STATE (NO INTRPT)
• NO SPECIFICATIONS INT FOR STM

```

```

002726 45 2 0 D 1AC
00272A 47 F 0 D 77E
00272E 48 1 0 0 01E
002732 99 00 1 000
002736 47 F 0 D 77E
00273A 18 6 9
00273C 17 5 5
00273E 48 3 0 0 010
002742 48 4 0 0 012
002746 54 3 0 0 324
00274A 54 4 0 0 324
00274E 1A 3 3
002750 1A 4 4
002752 46 6 0 D 74E
002756 40 3 0 0 050
00275A 16 5 4
00275C 47 F 0 2 000
002760 18 6 9
002762 17 5 5
002764 5B 6 0 D 82C
002768 48 4 0 0 012
00276C 54 3 0 0 324
002770 1A 4 4
002772 46 6 0 D 770
002776 40 4 0 0 050
00277A 47 F 0 2 000
00277E 41 1 0 D 830
002782 0A 00
002784 45 2 0 D 1AC
002788 58 1 0 D 5DC
00278C 58 5 0 D 5DC
002790 58 A 0 D 5CC
002794 12 A A
002796 89 1 0 0 000
00279A 47 8 0 D 7A2
00279E 99 00 D 79E
0027A2 19 1 5
0027A4 47 8 0 D 7AC
0027A8 99 00 1 000
0027AC 41 9 0 0 001
0027B0 41 8 0 0 00F
0027B4 58 1 0 D 5DC
0027B8 45 2 0 D 73A
0027BC 89 1 0 9 000

```

```

STM07 BAL R2,SPECIR
BC 15,SLLTST
STMER1 LH R1,OPRPSW+6(,0)
HPR 0(R1)
BC 15,SLLTST
SL1CHK LR R6,R9
XR R5,R5
LH R3,S1ABS(0,0)
LH R4,S1ABS+2(,0)
N R3,SXONES
N R4,SXONES
SL1 AR R3,R3
AR R4,R4
BCT R6,SL1
STM R3,S5ABS(0,0)
OR R5,R4
BC 15,0(,R2)
SL2CHK LR R6,R9
XR R5,R5
S R6,TENHEX
LH R4,S1ABS+2(0,0)
N R3,SXONES
SL2 AR R4,R4
BCT R6,SL2
STM R4,S5ABS(0,0)
BC 15,0(,R2)
SLLTST LA R1,SLLER1
SVC SRSS
BAL R2,SPECIR
L R1,ALLAS
L R5,ALLAS
L R10,ALLOS
LTR R10,R10
SLL R1,0(0)
BC ZERO,SLL01
HPR
SLL01 CR R1,R5
BC EQL,SLL02
HPR 0(R1)
SLL02 LA R9,1(,0)
LA R8,15(,0)
SLL03 L R1,ALLAS
BAL R2,SL1CHK
SLL R1,0(R9)

```

```

CHECK FOR VALID SPEC-INT CODE
CONTINUE TO SLL TEST
GET ERRING INTRPT ADDRESS
• UNEXPECTED INT : DISPLAY ADR
CONTINUE TO SLL TEST
SETUP RESULTS FOR SLL.16
CLEAR RESULTS
R1 = DATA, R6 = SHIFT COUNT
SHIFT R3,R4 LEFT BY ADDS.
CLEAR SIGN EXTENSION
CLEAR SIGN EXTENSION
SHIFT R3 1 PLACE
SHIFT R4 1 PLACE
FINISH OUT SHIFT COUNT
SAVE TOP HALF OF ANS.
OR-IN LOW HALF OF ANS.
EXIT
SETUP RESULTS FOR SLL>16
CLEAR RESULTS
GET SHIFT COUNT MOD 16
GET LOW HALF OF SHIFT DATA
CLEAR SIGN EXTENSION
SHIFT 1 PLACE.
FINISH SHIFT COUNT (R6)
STORE XPTD ANSWER.
EXIT
SHIFT LEFT SINGLE LOGICAL
SUPERVISOR REGISTERS/STATE
CHECK LAST STM INT FOR SPEC
R1 = AAAAAAAAAA . NOW
R5 = AAAAAAAAAA . SET UP
R10 = 00000000 . FIRST
CC = ZERO . SLL
TRY FIRST SLL (NO SHIFT XPTD)
BRANCH IF CC UNCHANGED
• SLL CHANGED CC FROM ZERO
CHECK SHIFTED DATA VS XPTD
BRANCH IF OK
• SHIFT ZERO PLACES FAILED
R9 = 00000001 = SHIFT COUNT
R8 = 0000000F = # LOOPS (SLL03)
SHIFT DATA = AAAAAAAAAA
PREPARE XPTD SHIFT RESULT
SHIFT DATA (R9) PLACES

```

```

0027C0 19 1 5
0027C2 47 8 0 0 7CA
0027C6 99 00 9 000
0027CA 41 9 0 9 001
0027CE 46 8 0 0 7B4
0027D2 58 1 0 0 2F0
0027D6 89 1 0 0 010
0027DA 59 1 0 0 2F8
0027DE 47 8 0 0 7E6
0027E2 99 00 9 000
0027E6 41 9 0 0 011
0027EA 41 8 0 0 00F
0027EE 58 1 0 0 5DC
0027F2 45 2 0 0 760
0027F6 89 1 0 9 000
0027FA 19 1 5
0027FC 47 8 0 0 804
002800 99 00 9 000
002804 41 9 0 9 001
002808 46 8 0 0 7EE
00280C 41 9 0 0 020
002810 58 5 0 0 5CC
002814 58 1 0 0 2F0
002818 89 1 0 9 000
00281C 19 1 5
00281E 47 8 0 0 838
002822 99 00 9 000
002826 47 F 0 0 838
00282A 0000
00282C 00000010
002830 48 1 0 0 01E
002834 99 00 1 000
002838 41 1 0 0 A38
00283C 0A 00
00283E 58 1 0 0 5CC
002842 58 5 0 0 5DC
002846 58 8 0 0 5CC
00284A 12 1 5
00284C 88 1 0 0 000
002850 47 8 0 0 A34
002854 19 1 5
002856 47 8 0 0 85E
00285A 99 00 1 000
00285E 41 9 0 0 001

```

SLL04

SLL05

SLL06

SLL07

SLL08

TENHEX

SLLER1

SRLTST

SRLX01

```

CR R1,R5
BC EQL,SLL04
HPR 0(R9)
LA R9,1(,R9)
BCT R8,SLL03
L R1,MINUS1
SLL R1,16(0)
C R1,XGAR1
BC EQL,SLL06
HPR 0(R9)
LA R9,17(,0)
LA R8,15(,0)
L R1,ALLAS
BAL R2,SL2CHK
SLL R1,0(R9)
CR R1,R5
BC EQL,SLL08
HPR 0(R9)
LA R9,1(,R9)
BCT R8,SLL07
LA R9,32(,0)
L R5,ALLOS
L R1,MINUS1
SLL R1,0(R9)
CR R1,R5
BC EQL,SRLTST
HPR 0(R9)
BC 15,SRLTST

DC F'16'
LH R1,OPRPSW+6(,0)
HPR 0(R1)
LA R1,SRLER1
SVC SRSS
L R1,ALLOS
L R5,ALLAS
L R8,ALLOS
LTR R1,R5
SRL R1,0(0)
BC 11,SRLCC1
CR R1,R5
BC EQL,SRLX01
HPR 0(R1)
LA R9,1(,0)

```

COMPARE DATA TO XPTD RESULT  
BRANCH IF OK

- DATA NOT SHIFTED RIGHT; AD=(R9)  
INCREMENT # PLACES TO SHIFT  
COMPLETE SHIFT : 0.R9 ,16  
R1= FFFFFFFF SETUP SHIFT=16  
SHIFT 16 PLACES  
COMPARE TO FFFF0000  
BRANCH IF OK
- SHIFT 16 PLACES DIDNT WORK  
R9 = 00000011 = SHIFT COUNT  
R8 = 0000000F = # OF LOOPS  
R1 = AAAAAAAA = SHIFT DATA  
SETUP XPTD SHIFT RESULT  
SHIFT (R9) PLACES  
COMPARE DATA TO XPTD RESULT  
BRANCH IF OK
- DISPLAY ERRING SHIFT COUNT  
INCREMENT SHIFT COUNT  
COMPLETE SHIFTS: 16. R9 ,32  
SETUP SHIFT 32 PLACES  
R5 = 00000000 = XPTD RESULT  
R1 = FFFFFFFF = SHIFT DATA  
SHIFT 32 PLACES  
COMPARE RESULT TO XPTD VALUE  
BRANCH IF OK
- SHIFT 32 PLACES IS BAD  
CONTINUE TO SHIFT RIGHT TEST

HEX CONSTANT = 00000010

GET ADDRESS FROM OLD PSW

- UNEXPECTED PROGRAM INT (R1=ADR)  
UNEXPECTED PROG INT STOP ADR  
SUPERVISOR REGISTERS/STATE

EXPECTED VALUE IN R5

- SHIFT COUNT = 00000000 FAILED



|        |                   |        |     |                   |                                 |
|--------|-------------------|--------|-----|-------------------|---------------------------------|
| 002862 | 41 8 0 0 00F      |        | LA  | R8,15(,0)         |                                 |
| 002866 | 58 1 0 0 5DC      | SRLX1A | L   | R1,ALLAS          |                                 |
| 00286A | 45 7 0 0 A3C      |        | BAL | R7,SR1CHK         |                                 |
| 00286E | 88 1 0 9 000      |        | SRL | R1,0(R9)          |                                 |
| 002872 | 19 1 5            |        | CR  | R1,R5             |                                 |
| 002874 | 47 8 0 0 87C      |        | BC  | EQL,SRLX1B        |                                 |
| 002878 | 99 00 9 000       |        | HPR | 0(R9)             | • SHIFT COUNT IN AO DIDNT WORK  |
| 00287C | 41 9 0 9 001      | SRLX1B | LA  | R9,1(,R9)         |                                 |
| 002880 | 46 8 0 0 866      |        | BCT | R8,SRLX1A         |                                 |
| 002884 | 58 1 0 0 2F0      |        | L   | R1,MINUS1         |                                 |
| 002888 | 88 1 0 0 010      |        | SRL | R1,16(0)          |                                 |
| 00288C | 59 1 0 0 324      |        | C   | R1,5XONES         | COMPARE TO EXPECTED VALUE=FFFF  |
| 002890 | 47 8 0 0 898      |        | BC  | EQL,SRLX02        |                                 |
| 002894 | 99 00 1 000       |        | HPR | 0(R1)             | • SHIFT COUNT = 16 DIDNT WORK   |
| 002898 | 41 9 0 0 011      | SRLX02 | LA  | R9,17(,0)         |                                 |
| 00289C | 41 8 0 0 00F      |        | LA  | R8,15(,0)         |                                 |
| 0028A0 | 58 1 0 0 5DC      | SRLX2A | L   | R1,ALLAS          |                                 |
| 0028A4 | 45 7 0 0 A6A      |        | BAL | R7,SR2CHK         |                                 |
| 0028A8 | 88 1 0 9 000      |        | SRL | R1,0(R9)          |                                 |
| 0028AC | 19 1 5            |        | CR  | R1,R5             |                                 |
| 0028AE | 47 8 0 0 8B6      |        | BC  | EQL,SRLX2B        |                                 |
| 0028B2 | 99 00 9 000       |        | HPR | 0(R9)             | • SHIFT COUNT = (AD) DIDNT WORK |
| 0028B6 | 41 9 0 9 001      | SRLX2B | LA  | R9,1(,R9)         |                                 |
| 0028BA | 46 8 0 0 8A0      |        | BCT | R8,SRLX2A         |                                 |
| 0028BE | 41 9 0 0 020      |        | LA  | R9,32(,0)         |                                 |
| 0028C2 | 58 5 0 0 5CC      |        | L   | R5,ALLOS          |                                 |
| 0028C6 | 58 1 0 0 2F0      |        | L   | R1,MINUS1         |                                 |
| 0028CA | 88 1 0 9 000      |        | SRL | R1,0(R9)          |                                 |
| 0028CE | 19 1 5            |        | CR  | R1,R5             |                                 |
| 0028D0 | 47 8 0 0 8D8      |        | BC  | EQL,TR1           |                                 |
| 0028D4 | 99 00 9 000       |        | HPR | 0(R9)             |                                 |
| 0028D8 | 41 1 0 0 934      | TR1    | LA  | R1,TRINT          |                                 |
| 0028DC | 0A 00             |        | SVC | SRSS              |                                 |
| 0028DE | DC 03 D 4D2 D 4D6 |        | TR  | TRCON1(4),TRTBLE  |                                 |
| 0028E4 | 05 03 D 4D2 D 2F0 |        | CLC | TRCON1(4),MINUS1  |                                 |
| 0028EA | 47 8 0 0 8F2      |        | BC  | EQL,TR2           |                                 |
| 0028EE | 99 00 0 8EE       |        | HPR |                   |                                 |
| 0028F2 | DC 03 D 4DE D 4E2 | TR2    | TR  | TRCON2(4),TRTBLE  |                                 |
| 0028F8 | 05 03 D 4DE D 4F2 |        | CLC | TRCON2(4),TRRES2  |                                 |
| 0028FE | 47 8 0 0 906      |        | BC  | EQL,TR3           |                                 |
| 002902 | 99 00 0 902       |        | HPR |                   |                                 |
| 002906 | DC 0F D 4F6 D 4E2 | TR3    | TR  | TRCON3(16),TRTBLE |                                 |
| 00290C | 05 0F D 4F6 D 4E2 |        | CLC | TRCON3(16),TRTBLE |                                 |
| 002912 | 47 8 0 0 91A      |        | BC  | EQL,TR4           |                                 |

• SHIFT COUNT IN AO DIDNT WORK

COMPARE TO EXPECTED VALUE=FFFF

• SHIFT COUNT = 16 DIDNT WORK

• SHIFT COUNT = (AD) DIDNT WORK

NEXT CHECK TRANSLATE

• SHIFT COUNT = (R9) DIDNT WORK  
BEGIN TESTING TRANSLATE INST  
UNEXPECTED INTERRUPT PREP  
TRANSLATE ALL ZEROS  
RESULT SHOULD EQUAL FFFFFFFF

• TR ERROR, ZERO TRANSLATE  
TRY 4 CHARACTER TRANSLATE  
RESULT IS IN R4

• TR. ERROR, NONZERO TRANSLATED  
TRANSLATE TO COMPLEMENTS  
RESULT SHOULD EQUAL TABLE

|        |                   |       |     |                   |  |                                    |
|--------|-------------------|-------|-----|-------------------|--|------------------------------------|
| 002916 | 99 00 D 916       |       | HPR |                   |  |                                    |
| 00291A | DC 0F D 4F6 D 4E2 | TR4   | TR  | TRCON3(16),TRTBLE |  | • TR ERROR, WHOLE TABLE TRANSLOD   |
| 002920 | DC 0F D 4F6 D 4E2 |       | TR  | TRCON3(16),TRTBLE |  | TRANSLATE OPPOSITE DIRECTION       |
| 002926 | D5 0F D 4F6 D 4E2 |       | CLC | TRCON3(16),TRTBLE |  | TRANSLATE BACK TO EQUAL TABLE      |
| 00292C | 47 8 0 D 938      |       | BC  | EQL,ED1           |  | DID BOTH TRANSLATES WORK           |
| 002930 | 99 00 D 930       |       | HPR |                   |  | NEXT CHECK EDIT                    |
| 002934 | 99 00 D 934       | TRINT | HPR |                   |  | • TR IN OPPOSITE DIRECTION FAILS   |
| 002938 | 41 1 0 D A28      | ED1   | LA  | R1,EDINT          |  | • UNEXPECTED PROGRAM INTERRUPT     |
| 00293C | 0A 00             |       | SVC | SRSS              |  | UNEXPECTED INTERRUPT ADDRESS       |
| 00293E | DE 07 D 50A D 506 |       | ED  | EDMSK1(8),EDFLD1  |  |                                    |
| 002944 | D5 07 D 50A D 512 |       | CLC | EDMSK1(8),EDRES1  |  | MOVE CHARACTERS WITH EDIT          |
| 00294A | 47 8 0 D 952      |       | BC  | EQL,ED2           |  | COMPARE TO EXPECTED RESULT         |
| 00294E | 99 00 D 94E       |       | HPR |                   |  |                                    |
| 002952 | DE 07 D 51E D 51A | ED2   | ED  | EDMSK2(8),EDFLD2  |  | • INITIAL EDIT CONDITION FAILURE   |
| 002958 | D5 07 D 51E D 526 |       | CLC | EDMSK2(8),EDRES2  |  | ZERO SUPPRESS ENTIRE FIELD         |
| 00295E | 47 8 0 D 966      |       | BC  | EQL,ED3           |  | COMPARE TO EXPECTED RESULT         |
| 002962 | 99 00 D 962       |       | HPR |                   |  |                                    |
| 002966 | DE 07 D 532 D 52E | ED3   | ED  | EDMSK3(8),EDFLD3  |  | • ZERO SUPPRESS FAILURE, ALL ZEROS |
| 00296C | D5 07 D 532 D 53A |       | CLC | EDMSK3(8),EDRES3  |  | ZERO SUPPRESS BEGIN OF FIELD       |
| 002972 | 47 8 0 D 97A      |       | BC  | EQL,ED4           |  | COMPARE TO EXPECTED RESULT         |
| 002976 | 99 00 D 976       |       | HPR |                   |  |                                    |
| 00297A | DE 07 D 546 D 542 | ED4   | ED  | EDMSK4(8),EDFLD4  |  | • ZERO SUPPRESS FAIL, BEGIN ZEROS  |
| 002980 | D5 07 D 546 D 54E |       | CLC | EDMSK4(8),EDRES4  |  | CHECK SIGNIFICANCE CHARACTER       |
| 002986 | 47 8 0 D 98E      |       | BC  | EQL,ED5           |  | COMPARE TO EXPECTED RESULT         |
| 00298A | 99 00 D 98A       |       | HPR |                   |  |                                    |
| 00298E | DE 07 D 55A D 556 | ED5   | ED  | EDMSK5(8),EDFLD5  |  | • SIGNIFICANCE CHARACTER FAILURE   |
| 002994 | D5 07 D 55A D 562 |       | CLC | EDMSK5(8),EDRES5  |  | ZERO SUPPRESS W FIELD DESIGNATOR   |
| 00299A | 47 8 0 D 9A2      |       | BC  | EQL,ED6           |  |                                    |
| 00299E | 99 00 D 99E       |       | HPR |                   |  |                                    |
| 0029A2 | DE 09 D 56D D 56A | ED6   | ED  | EDMSK6(10),EDFLD6 |  | • FIELD DESIGNATOR FAILURE         |
| 0029A8 | D5 09 D 56D D 577 |       | CLC | EDMSK6(10),EDRES6 |  | EDIT, INSERTING CHARACTERS         |
| 0029AE | 47 8 0 D 986      |       | BC  | EQL,ED7           |  | COMPARE TO EXPECTED RESULT         |
| 0029B2 | 99 00 D 982       |       | HPR |                   |  |                                    |
| 0029B6 | DE 07 D 584 D 581 | ED7   | ED  | EDMSK7(8),EDFLD7  |  | • INSERTING CHARACTERS FAILS       |
| 0029BC | D5 07 D 584 D 58C |       | CLC | EDMSK7(8),EDRES7  |  | INSERT CHAR W SIGNIFICANCE         |
| 0029C2 | 47 8 0 D 9CA      |       | BC  | EQL,ED8           |  | COMPARE TO EXPECTED RESULT         |
| 0029C6 | 99 00 D 9C6       |       | HPR |                   |  |                                    |
| 0029CA | DE 07 D 597 D 594 | ED8   | ED  | EDMSK8(8),EDFLD8  |  | • INS CHAR W SIGNIFICANCE FAILS    |
| 0029D0 | D5 07 D 597 D 59F |       | CLC | EDMSK8(8),EDRES8  |  | EDIT NEGATIVE SIGN                 |
| 0029D6 | 47 8 0 D 9DE      |       | BC  | EQL,ED9           |  | COMPARE TO EXPECTED RESULT         |
| 0029DA | 99 00 D 9DA       |       | HPR |                   |  |                                    |
| 0029DE | DE 07 D 5AA D 5A7 | ED9   | ED  | EDMSK9(8),EDFLD9  |  | • CR GENERATION ERROR              |
| 0029E4 | D5 07 D 5AA D 5B2 |       | CLC | EDMSK9(8),EDRES9  |  | EDIT, NOT NEGATIVE SIGN            |
| 0029EA | 47 8 0 D A88      |       | BC  | EQL,EDASC1        |  | COMPARE TO EXPECTED RESULT         |
|        |                   |       |     |                   |  | NEXT CHECK ASCII MODE              |

|        |                   |     |        |                    |                                 |  |
|--------|-------------------|-----|--------|--------------------|---------------------------------|--|
| 0029EE | 99 00 D 9EE       | HPR |        |                    |                                 |  |
| 0029F2 | DE 05 D 5BA D 518 | ED  | EDCCDT | EDCCM1(6),EDFLD2+1 | • CR GENERATED IMPROPERLY       |  |
| 0029F8 | 47 8 0 D A00      | BC  |        | ZERO,EDCCD2        | SHOULD GIVE ZERO CONDITION CODE |  |
| 0029FC | 99 00 D 9FC       | HPR |        |                    |                                 |  |
| 002A00 | DE 05 D 5C0 D 5A7 | ED  | EDCCD2 | EDCCM2(6),EDFLD9   | • CONDITION CODE FOR ZERO ERROR |  |
| 002A06 | 47 2 0 D A0E      | BC  |        | GTZ,EDCCD3         | SHOULD GIVE POSITIVE COND CODE  |  |
| 002A0A | 99 00 D A0A       | HPR |        |                    |                                 |  |
| 002A0E | DE 05 D 5C6 D 594 | ED  | EDCCD3 | EDCCM3(6),EDFLD8   | • OP2 POSITIVE COND CODE ERROR  |  |
| 002A14 | 47 4 0 D A1C      | BC  |        | LSZ,EDCCD4         | SHOULD GIVE NEGATIVE COND CODE  |  |
| 002A18 | 99 00 D A18       | HPR |        |                    |                                 |  |
| 002A1C | 47 1 0 D A24      | BC  | EDCCD4 | OVFLOW,EDCDER      | • OP2 NEG COND CODE ERROR       |  |
| 002A20 | 47 F 0 D A2C      | BC  |        | UNCOND,DHRXIT      | UNUSED CONDITION CODE           |  |
| 002A24 | 99 00 D A24       | HPR | EDCDER |                    | BRANCH IF DMR DONE              |  |
| 002A28 | 99 00 D A28       | HPR | EDINT  |                    | • UNUSED COND CODE ERROR        |  |
| 002A2C | 07000700          | DC  | DHRXIT | X'07000700'        | • UNEXPECTED PROGRAM INTERRUPT  |  |
| 002A30 | 18 C E            | LR  |        | R12,R14            | NO-OP                           |  |
| 002A32 | 07 F C            | BCR |        | 15,12              | SETUP BASE REGISTER FOR MPX     |  |
| 002A34 | 99 00 D A34       | HPR | SRLCC1 |                    | BRANCH TO START OF MPX=TEST     |  |
| 002A38 | 99 00 D A38       | HPR | SRLER1 |                    | • SRL CHANGED CONDITION CODE    |  |
| 002A3C | 17 5 5            | XR  | SR1CHK | R5,R5              | • UNEXPECTED PROGRAM INT        |  |
| 002A3E | 41 6 0 0 010      | LA  |        | R6,16(,0)          | PREPARE XPTD SRL RESULT (,16)   |  |
| 002A42 | 18 6 9            | SR  |        | R6,R9              | R9=SHIFT COUNT ,16 (R1=DATA)    |  |
| 002A44 | 48 2 0 0 010      | LH  |        | R2,S1ABS(,0)       | LET R1= DDDDAAAA                |  |
| 002A48 | 48 3 0 0 012      | LH  |        | R3,S1ABS+2(,0)     | THEN R2=0000DDDD                |  |
| 002A4C | 54 2 0 0 324      | N   |        | R2,SXONES          | R3=0000AAAA X=DONT USE          |  |
| 002A50 | 54 3 0 0 324      | N   |        | R3,SXONES          | CLEAR SIGN EXTENSION            |  |
| 002A54 | 89 2 0 6 000      | SLL |        | R2,0(R6)           | CLEAR SIGN EXTENSION            |  |
| 002A58 | 89 3 0 6 000      | SLL |        | R3,0(R6)           | SHIFT R2 (16-R9)= YYYYYXXX      |  |
| 002A5C | 48 5 0 0 030      | LH  |        | R5,S3ABS(,0)       | SHIFT R3 (16-R9)= ZZZZXXXX      |  |
| 002A60 | 54 5 0 0 324      | N   |        | R5,SXONES          | GET LOW PORTION OF XPTD ANS     |  |
| 002A64 | 16 5 2            | OR  |        | R5,R2              | CLEAR SIGN EXTENSION            |  |
| 002A66 | 47 F 0 7 000      | BC  |        | 15,0(,R7)          | OR=IN UPPER PART OF ANSWER      |  |
| 002A6A | 17 5 5            | XR  | SR2CHK | R5,R5              | EXIT WITH ANSWER IN R5          |  |
| 002A6C | 18 2 5            | LR  |        | R2,R5              | PREPARE XPTD SRL RESULT (,16)   |  |
| 002A6E | 41 6 0 0 020      | LA  |        | R6,32(,0)          | R9=SHIFT COUNT ,16 (R1=DATA)    |  |
| 002A72 | 18 6 9            | SR  |        | R6,R9              | LET R1 = DDDDAAAA               |  |
| 002A74 | 48 2 0 0 010      | LH  |        | R2,S1ABS(,0)       | SHIFT R1 (32-R9) = YYYYYXXX     |  |
| 002A78 | 54 2 0 0 324      | N   |        | R2,SXONES          |                                 |  |
| 002A7C | 89 2 0 6 000      | SLL |        | R2,0(R6)           | CLEAR SIGN EXTENSION            |  |
| 002A80 | 48 5 0 0 020      | LH  |        | R5,S2ABS(,0)       | ANSWER FROM R2 = 0000YYYY       |  |
| 002A84 | 47 F 0 7 000      | BC  |        | 15,0(,R7)          |                                 |  |
| 002A88 | 0A 0A             | SVC | EDASCI | ASCCD              | EXIT WITH ANSWER IN R5          |  |
| 002A8A | DE 07 D ACC D AC8 | ED  |        | EDMSKA(8),EDFLDA   | CHANGE TO ASCII MODE            |  |
| 002A90 | D5 07 D ACC D AD4 | CLC |        | EDMSKA(8),EDRESA   | EDIT WITH ASCII CODES           |  |

|        |                   |        |
|--------|-------------------|--------|
| 002A96 | 47 8 0 D A9E      |        |
| 002A9A | 99 00 D A9A       |        |
| 002A9E | DE 07 D AEO D ADC | EDASC2 |
| 002AA4 | D5 07 D AEO D AEB |        |
| 002AAA | 47 8 0 D AB2      |        |
| 002AAE | 99 00 D AAE       |        |
| 002AB2 | 41 1 0 D A28      | EDCCD  |
| 002AB6 | 0A 00             |        |
| 002AB8 | 47 F 0 D 9F2      |        |
| 002ABC | 0700 0700         |        |
| 002AC0 | 38000000 00000214 | XITPSW |
| 002AC8 | 0000000A          | EDFLDA |
| 002ACC | A0808080 80818080 | EDMSKA |
| 002AD4 | A0A0A0A0 A0A03030 | EDRESA |
| 002ADC | 00200200          | EDFLDB |
| 002AE0 | A0808080 82818080 | EDMSKB |
| 002AEB | A0A0A032 A0A03032 | EDRESB |
|        | 003000            |        |

BC  
HPR  
ED  
CLC  
BC  
HPR  
LA  
SVC  
BC  
CNOP  
DC  
DC  
DC  
DC  
DC  
DC  
DC  
ORG  
DROP  
USING

EQL,EDASC2

EDMSKB(8),EDFLDB  
EDMSKB(8),EDRESB  
EQL,EDCCD

R1,EDINT  
SRSS  
15,EDCCDT  
0,8

X'3800000000000214' \*\* EXIT PSW FOR END OF DMR/LOADER  
X'0000000A'  
X'A080808080818080'  
X'A0A0A0A0A0A03030'  
X'00200200'  
X'A080808082818080'  
X'A0A0A032A0A03032'  
SDMR+8192  
12,13,14,15  
\*,12,13

- ASCII CODE EDIT ERROR  
CHECK ASCII FIELD SEPERATOR
- NEXT CHECK CONDITION CODES
- ASCII FIELD SEPERATOR ERROR  
SET UP INTERRUPT LOCATION  
CHANGE BACK TO EBCDIC  
NEXT CHECK CONDITION CODES



```
00307E 58 1 0 0 114
003082 19 1 6
003084 07 8 B
003086 99 00 B 000
00308A 07 F B
```

```
00308C 41 1 0 C 0C8
003090 40 1 0 0 09E
003094 41 1 0 C 0CC
003098 40 1 0 0 08E
00309C 41 1 0 C 0D0
0030A0 40 1 0 0 0DE
0030A4 41 1 0 C 0D4
0030A8 40 1 0 0 0EE
0030AC 41 1 0 C 0D8
0030B0 40 1 0 0 0CE
0030B4 41 1 0 C 0DC
0030B8 40 1 0 0 0AE
0030BC 41 1 0 C 0E0
0030C0 40 1 0 0 0BE
0030C4 07 F 2
0030C6 0700
0030C8 99 00 C 0C8
0030CC 99 00 C 0CC
0030D0 99 00 C 0D0
0030D4 99 00 C 0D4
0030D8 99 00 C 0D8
0030DC 99 00 C 0DC
0030E0 99 00 C 0E0
```

```
0030E4 000030E8
0030E8 0010
0030EA 30EC
0030EC 00FFFFFF
00FFFFFF
```

```
0030F4 00000000
0030F8 000030F5
0030FC 0C800000
003100 0000000F
003104 00020114
003108 0010
00310A 30F4
00310C 00000004
003110 00000114
```

```
INT2 L R1,X'114'(,0)
CR R1,R6
BCR 8,R11
HPR 0(R11)
BCR 15,R11
```

```
***** SETUP PSWS FOR UNEXPECTED INTERRUPTS (ERROR STOP ADDRESSES) *
NPSWS LA R1,UNEXP1
 STH R1,NPRPSW+6(,0)
 LA R1,UNEXP2
 STH R1,NSVPSW+6(,0)
 LA R1,UNEXP3
 STH R1,NS1PSW+6(,0)
 LA R1,UNEXP4
 STH R1,NS2PSW+6(,0)
 LA R1,UNEXP5
 STH R1,NMNPSW+6(,0)
 LA R1,UNEXP6
 STH R1,NTMPSW+6(,0)
 LA R1,UNEXP7
 STH R1,NMSPSW+6(,0)
 BCR 15,R2
 CNOP 0,8
```

```
UNEXP1 HPR
UNEXP2 HPR
UNEXP3 HPR
UNEXP4 HPR
UNEXP5 HPR
UNEXP6 HPR
UNEXP7 HPR
```

```
*
STASCW DC A(STABCW)
STABCW DC X'0010'
 DC Y(TABLE)
TABLE DC 2X'00FFFFFF'
```

```
SNSBUF DC F'0'
BPLS DC A(SNSBUF+1)
OC80 DC X'0C800000'
HOLDX1 DC X'0000000F'
 DC X'00020114'
 DC X'0010'
 DC Y(SNSBUF)
SENSX1 DC F'4'
 DC X'00000114'
```

```
GET CONSOLE BCW AFTER I/O
COMPARE TO EXPECTED BCW
BRANCH IF BCW IS OK (EXIT)
* UNEXPECTED BCW ENCOUNTERED
EXIT FROM I/O CHECKER
```

```
* SET ERROR STOPS FOR UNEXPECTED
INTERRUPTS PROGRAM
```

SUPERVISOR

SELECTOR 1

SELECTOR 2

MPX NON-SHR

TIMER

MPX SHARED

EXIT FROM PSW SETUP

```
* UNEXPECTED PROGRAM INTERRUPT
* UNEXPECTED SVC INTERRUPT
* UNEXPECTED SELECTOR 1 INTERRUPT
* UNEXPECTED SELECTOR 2 INTERRUPT
* UNEXPECTED MPX-NON-SHARED INT
* UNEXPECTED TIMER INTERRUPT
* UNEXPECTED MPX-SHARED INTERRUPT
```

```
MPX NON-SHARED STATUS SCW
MPX NON-SHARED BCW (ONE WORD)
STATUS WORD STORAGE ADDRESS
STATUS TABLE STORAGE
```

```
I/O BUFFER FOR SENSE/HOLD
BCW EXPECTED FOR ABOVE BUFFER
STATUS (SCW) EXPECTED: HLD/SNS
HOLD COMMAND CODE
HOLD SCW (WRITE BCW ADDR)
HOLD BCW (ONE BYTE) AT 0114
HOLD BCW (BUFFER ADDRESS) 0114
SENSE COMMAND CODE
SENSE SCW (BCW ADDRESS)
```

|        |          |        |             |                                |
|--------|----------|--------|-------------|--------------------------------|
| 003114 | 0010     | DC     | X'0010'     | SENSE BCW (ONE BYTE) AT 0114   |
| 003116 | 30F4     | DC     | Y(SNSBUF)   | SENSE BCW (BUF ADR) AT 0114    |
| 003118 | 00000003 | SHNOOP | F'3'        | NO-OP COMMAND CODE             |
| 00311C | 00020114 | SHNSCW | X'00020114' | NO-OP SCW (WRITE FLAG,BCW ADR) |
| 003120 | 0010     | SHNBCW | X'0010'     | NO-OP BCW (ONE BYTE) AT 00114  |
| 003122 | 3124     | DC     | Y(ZERBX)    | NO-OP BCW (BCW ADR.) AT 00114  |
| 003124 | 00000000 | ZERBX  | F'0'        | IMMEDIATE CMD I/O BUFFER ,.... |
| 003128 | FEFDFBF7 | SLIDE0 | X'FEFDFBF7' | SLIDING ZERO : LOW 4-BITS      |
| 00312C | EFDFFBF7 | DC     | X'EFDFFBF7' | SLIDING ZERO : HI 4-BITS       |
| 003130 | 01020408 | SLIDE1 | X'01020408' | SLIDING ONE : LOW 4-BITS       |
| 003134 | 10204080 | DC     | X'10204080' | SLIDING ONE : HI 4-BITS        |
| 003138 | FF00AAAA | FF00XX | X'FF00AAAA' | ALL ONES / ALL ZEROS           |
| 00313C | AAAAAAAA | ALLSA  | X'AAAAAAAA' | DATA PATTERN : 1010101010...   |
| 003140 | 55555555 | ALL\$5 | X'55555555' | DATA PATTERN : 0101010101...   |
| 003144 | 0000FFFF | OFFFF  | X'0000FFFF' | HALF-WORD CONSTANT             |
| 003148 | 08000000 | COMPAR | X'08000000' |                                |

DATA=TURNAROUND SUBROUTINE...CHECKS I/O BUFFER BITS.

|        |              |        |     |                  |                                 |
|--------|--------------|--------|-----|------------------|---------------------------------|
| 00314C | 41 3 0 C 160 | SENSE1 | LA  | R3,HSERR1        | PICKUP ERROR-STOP ADDRESS       |
| 003150 | 98 0 2 C 10C |        | LM  | R0,R2,SENSX1     | PICKUP SENSE I/O PACKET         |
| 003154 | 45 4 0 C 02C | CALL10 | BAL | R4,S10MSH        | CALL MPX-SHARED I/O ROUTINE     |
| 003158 | 47 8 0 C 166 |        | BC  | 8,HSINT          | BRANCH IF CC FOR NORMAL COMPLTN |
| 00315C | 99 00 B 000  |        | HPR | 0(R11)           | * BAD CC FROM HOLD OR SENSE     |
| 003160 | 99 00 B 000  | HSERR1 | HPR | 0(R11)           | * NO INT FROM HOLD OR SENSE     |
| 003164 | 07 F B       |        | BCR | 15,R11           | (ERROR EXIT)                    |
| 003166 | 48 1 0 0 100 | HSINT  | LH  | R1,X'100'(0,0)   | PICKUP TOP OF SCW FOR CONSOLE   |
| 00316A | 94 FD 0 013  |        | NI  | S1ABS+3(0),X'FD' | AND OUT THE SCW=WRITE FLAG      |
| 00316E | 49 1 0 C 0FC |        | CH  | R1,OC80          | COMPARE TO NORMAL COMPLETION    |
| 003172 | 47 8 0 C 17A |        | BC  | 8,OCOK           | BRANCH IF STATUS IS ALL OK      |
| 003176 | 99 00 B 000  |        | HPR | 0(R11)           | * BAD STATUS FROM HOLD/SENSE    |
| 00317A | 58 1 0 0 114 | OCOK   | L   | R1,X'114'((,0)   | PICKUP CONSOLE BCW              |
| 00317E | 59 1 0 C 0F8 |        | C   | R1,BPLS          | COMPARE TO EXPECTED BCW         |
| 003182 | 47 8 0 C 18A |        | BC  | 8,BCHSOK         | BRANCH IF BCW COMPLETED OK      |
| 003186 | 99 00 B 000  |        | HPR | 0(R11)           | * BAD BCW FROM HOLD/SENSE       |
| 00318A | 17 1 1       | BCHSOK | XR  | R1,R1            | CLEAR R1 FOR IC INSTRN          |
| 00318C | 43 1 0 C 0F4 |        | IC  | R1,SNSBUF        | PICKUP THE BYTE IN SNSBUF       |
| 003190 | 07 F B       |        | BCR | 15,R11           | NORMAL EXIT FROM HOLD/SENSE     |
| 003192 | 41 3 0 C 160 | HOLD1  | LA  | R3,HSERR1        | PICKUP ERROR-STOP ADDRESS       |
| 003196 | 98 0 2 C 100 |        | LM  | R0,R2,HOLDX1     | PICKUP HOLD I/O PACKET          |
| 00319A | 47 F 0 C 154 |        | BC  | 15,CALL10        | JOIN THE HOLD/SENSE CODING      |

THE DMR MULTIPLEX SHARED CODING BEGINS HERE WITH

СКССЗ

HPRO  
HPR1  
HPR2

CC30K

**SOCK 1**

**SOCK2****SOCK3**

SCW 1

BCW 1

IMMEDIATE-COMMAND CHECKING (NO DATA TRANSFER OR INTERRUPT  
(NO-OP, SELECT-SHARED, ILLEGAL COMMAND CODES) CC SHOULD STAY

LA R3,CKCC3  
BAL R2,NPSWS  
LR R13,R15  
LM R0,R2,SHNOOP  
BAL R4,S1OMSH  
L R1,OMSPSW(0,0)

|     |         |
|-----|---------|
| HPR | 0(R1)   |
| BC  | 4,CC30K |
| BC  | 8,HPR0  |
| BC  | 2,HPR1  |
| BC  | 1,HPR2  |

HPR  
HPR  
HPR  
HPR

```

TM CHECK CAW NOW
BC SOABS(0),X'F3'
IC 8,SOCK1
HPR R1,SOABS(,0)
TM O(R1)
BC SOABS(0),X'0C'
IC 1,SOCK2
HPR R1,SOABS(,0)
TM O(R1)
BC SOABS+3(0),X'FC'
IC 8,SOCK3
HPR R1,SOABS+3(,0)
TM O(R1)
BC SOABS+3(0),X'03'
IC 1,SCW1
HPR R1,SOABS+3(,0)
L O(R1)
CL R1,X'100'(,0)
BC R1,SHNSCW
HPR 8,BCW1
L O(R1)
CL R1,X'114'(,0)
BC R1,SHNBCW
HPR 8,BUF1
L O(R1)

```

```

START MPX-TEST: GET CK-ADDRESS
SETUP ERROR-STOP FOR UNXPT INT
SETUP BASE REGISTER/4K ADDRESS
PICKUP NO-OP I/O PACKET
CALL MPX-SHARED I/O ROUTINE
GOT AN INTERRUPT..SHOULDNT HAVE

• NOOP INTERRUPTED. SHOW DEVICE
 BRANCH IF CC=1 (EXPECTED) CC
 BRANCH IF CC=0 CC
 BRANCH IF CC=2 CC
 BRANCH IF CC=1 ***** CC
• NO-OP CC ERROR CC NOT 1 • CC
• NO-OP CC ERROR CC= 0 • CC
• NO-OP CC ERROR CC= 2 • CC
• NO-OP CC ERROR CC=1 • CC

 CHECK FOR BITS 0-5 SET CAW
 BRANCH IF 0-5 CLEAR (XPTD) CAW
 PICKUP 0-7 OF CAW CAW
• DISPLAY UNEXPECTED STATUS CAW
 CHECK FOR BITS 6-7 SET CAW
 BRANCH IF 6,7 SET (SHOULD) CAW
 PICKUP 0-7 OF CAW CAW
• DISPLAY UNEXPECTED STATUS CAW
 CHECK FOR BITS 24-29 CLEAR CAW
 BRANCH IF 24-29 CLEAR (XPT) CAW
 PICKUP COMMAND CODE = 03 ? CAW
• DISPLAY ERRING CMD CODE INOT 03
 CHECK BITS 29-31 SET IN CAW
 BRANCH IF 29,31 SET (OK) CAW
 PICKUP COMMAND FROM CAW CAW
• DISPLAY BAD CMD CODE NOT=3 CAW
 PICKUP ACTUAL SCW
 COMPARE TO ORIGINAL SCW
 BRANCH IF SAME (XPTD)
• DISPLAY BAD SCW
 PICKUP ACTUAL BCW
 COMPARE TO ORIGINAL BCW
 BRANCH IF SAME (XPTD)
• DISPLAY BAD BCW (CHANGED)

```



```

003238 58 1 0 C 124
00323C 12 1 1
00323E 47 8 0 C 246
003242 99 00 1 000
003246 41 3 0 C 25A
00324A 98 0 2 C 29C
00324E 45 4 0 C 02C
003252 58 1 0 0 038
003256 99 00 1 000
00325A 47 4 0 C 262
00325E 99 00 C 25E
003262 55 0 0 C 2A8
003266 47 8 0 C 26E
00326A 99 00 C 26A
00326E 58 1 0 0 100
003272 55 1 0 C 2A0
003276 47 8 0 C 27E
00327A 99 00 1 000
00327E 58 1 0 0 114
003282 55 1 0 C 2A4
003286 47 8 0 C 28E
00328A 99 00 1 000
00328E 58 1 0 C 124
003292 12 1 1
003294 47 8 0 C 2AC
003298 99 00 1 000
00329C 0000000B
0032A0 00020114
0032A4 0010
0032A6 3124
0032A8 0C00000B
0032AC 41 3 0 C 2C0
0032B0 98 0 2 C 308
0032B4 45 4 0 C 02C
0032B8 58 1 0 0 038
0032BC 99 00 1 000
0032C0 47 4 0 C 2C8
0032C4 99 00 C 2C4
0032C8 55 0 0 C 314
0032CC 47 8 0 C 2D4
0032D0 99 00 C 2D0
0032D4 58 1 0 0 100
0032D8 55 1 0 C 30C
0032DC 47 8 0 C 2E4

```

```

BUF1 L R1,ZERBX
LTR R1,R1
BC 8,SELSH
HPR 0(R1)
SELSH LA R3,CKCCB
LM R0,R2,SLSH1
BAL R4,S10MSH
L R1,OMSPSW(,0)
HPR 0(R1)
CKCCB BC 4,CKSD0B
HPR
CKSD0B CL R0,SLSHXX
BC 8,CKSCWB
HPR
CKSCWB L R1,X'100'(,0)
CL R1,SLSH1+4
BC 8,CKBCWB
HPR 0(R1)
CKBCWB L R1,X'114'(,0)
CL R1,SLSH1+8
BC 8,CKBUFB
HPR 0(R1)
CKBUFB L R1,ZERBX
LTR R1,R1
BC 8,ILLCMD
HPR 0(R1)
SLSH1 DC F'111'
DC X'00020114'
DC X'0010'
DC Y(ZERBX)
DC X'0C00000B'
SLSHXX LA R3,CKCCB
ILLCMD LM R0,R2,ILLCH1
BAL R4,S10MSH
L R1,OMSPSW(,0)
HPR 0(R1)
CKCCB BC 4,CKSD0B
HPR
CKSD0B CL R0,CMBCAW
BC 8,CKSCWB
HPR
CKSCWB L R1,X'100'(,0)
CL R1,ILLCH1+4
BC 8,CKBCWB

```

```

PICKUP IMMEDIATE=CMD BUFFER
CHECK IF STILL ZERO
BRANCH IF UNCHANGED (SHOULD BE)
• BUFFER CHANGED DURING NO=OP
PICKUP CC=CHECK ADDRESS
PICKUP I/O PACKET
SELECT=SHARED=DEVICE COMMAND
INTERRUPT.(UNEXPECTED).
DISPLAY DEVICE #
BRANCH IF CC=1 (CC IS OK)
• BAD CC ON SEL=SH. SHOULD BE 1
CHECK CAW EQL EXPECTED VALUE
BRANCH IF CAW IS OK
• CAW NOT EQL 0C00000B (XPTD)
CHECK THE SCW (ACTUAL)
COMPARE TO EXPECTED SCW
BRANCH IF SCW IS OK
• SCW IS IN ERROR..DISPLAY IT.
PICKUP THE BCW.
COMPARE TO EXPECTED BCW
BRANCH IF BCW IS OK
• BCW IS IN ERROR..DISPLAY IT.
PICKUP I/O BUFFER
CHECK FOR STILL ZERO
BRANCH IF ZERO (SHOULD BE)
• BUFFER CHANGED
SELECT=SHARED=DEVICE COMMAND
SCW = WRITE FLAG / BCW ADR
BCW : (ONE BYTE) AT 00114
BCW : (BUF ADR) AT 00114.
EXPECTED CAW AFTER SEL=MPX=SH
PICKUP CC=CHECK ADDRESS
PICKUP I/O PACKET
CALL MPX=SHARED I/O ROUTINE
UNEXPECTED INTERRUPT. GET DEV#
• DISPLAY DEVICE #
CHECK FOR CC=1 (NORMAL)
• CC NOT 1 FOR IMMEDIATE CMD
CHECK CAW FOR EXPECTED VALUES
BRANCH IF STATUS/CMD ARE OK
• COMMAND OR STATUS IN CAW WRONG
CHECK SCW. GET ACTUAL SCW
COMPARE TO INITIAL SCW
BRANCH IF NO CHANGE (XPTD)

```

```

0032E0 99 00 1 000
0032E4 58 1 0 0 114
0032E8 55 1 0 C 310
0032EC 47 8 0 C 2F4
0032F0 99 00 1 000
0032F4 58 1 0 C 124
0032F8 12 1 1
0032FA 47 8 0 C 318
0032FE 99 00 1 000
003302 47 F 0 C 318
003306 0000
003308 00000008
00330C 00000114
003310 0100
003312 3124
003314 02000008

003318 41 3 0 C 328
00331C 98 0 2 C 370
003320 45 4 0 C 02C
003324 99 00 C 324
003328 47 8 0 C 330
00332C 99 00 C 32C
003330 12 0 0
003332 47 8 0 C 33A
003336 99 00 0 000
00333A 58 1 0 0 100
00333E 55 1 0 C 374
003342 47 8 0 C 34A
003346 99 00 1 000
00334A 58 1 0 0 114
00334E 55 1 0 C 378
003352 47 8 0 C 35A
003356 99 00 1 000
00335A 58 1 0 C 124
00335E 12 1 1
003360 47 8 0 C 37C
003364 99 00 1 000
003368 99 00 C 368
00336C 47 F 0 C 37C
003370 00000000
003374 00000114
003378 0010
00337A 3124

```

```

CKBCW8 HPR 0(R1)
L R1,X'114'(.0)
CL R1,ILLCH1+8
BC 8,CKBUF8
HPR 0(R1)
CKBUF8 L R1,ZERBX
LTR R1,R1
BC 8,TIOX01
HPR 0(R1)
BC 15,TIOX01

ILLCH1 DC F'8'
DC X'00000114'
DC X'0100'
DC Y(ZERBX)
DC X'02000008'

CM8CAW
TIOX01 LA R3,TIOCC1
LM R0,R2,TIOPAK
BAL R4,SIOHSH
HPR
TIOCC1 BC 8,TIOCAW
HPR
TIOCAW LTR R0,R0
BC 8,TIOSCW
HPR 0(R0)
TIOSCW L R1,X'100'(.0)
CL R1,TIOPAK+4
BC 8,TIOBCW
HPR 0(R1)
TIOBCW L R1,X'114'(.0)
CL R1,TIOPAK+8
BC 8,TIOBUF
HPR 0(R1)
TIOBUF L R1,ZERBX
LTR R1,R1
BC 8,SNSX01
HPR 0(R1)
TIOER1 BC 15,SNSX01
DC F'0'
DC F'276'
DC X'0010'
DC Y(ZERBX)

```

```

• SCW CHANGED WHEN IT SHOULDN'T
 PICKUP BCW AFTER I/O
 COMPARE TO INITIAL BCW
 BRANCH IF NO CHANGE (OK)
• BCW CHANGED DURING ILLEGAL CMD
 PICKUP I/O BUFFER (WAS ZERO)
 COMPARE TO ZERO
 BRANCH IF NO CHANGE (OK)
• BUFFER CHANGED DURING IMM=CMD
 BRANCH TO TEST I/O CHECKING

ILLEGAL COMMAND CODE
SCW : (BCW ADDRESS)
BCW : (ONE BYTE) AT 00114
BCW : (BUF ADR) AT 00114
CAW : (UNIT CHECK,CMD) XPTD CAW

PICKUP CC CHECK ADDRESS
PICKUP TEST I/O PACKET
CALL MPX=I/O ROUTINE
• TEST I/O COMMAND INTERRUPTED
 BRANCH IF CC IS ZERO
• CC NOT ZERO AFTER TEST I/O
 CHECK FOR CAW CLEARED
 BRANCH IF CAW = 00000000.
• CAW NOT ZERO
 PICKUP CONSOLE SCW
 COMPARE TO EXPECTED SCW.
 BRANCH IF SCW OK.
• SCW CHANGED DURING TEST I/O
 PICKUP CONSOLE BCW
 COMPARE TO ORIGINAL BCW
 BRANCH IF EQUAL (OK)
• BCW CHANGED DURING TEST I/O
 PICKUP DATA-BUFFER
 CHECK IF STILL ZERO
 BRANCH TO SENSE TEST
• BUFFER CHANGED DURING TEST I/O
• INTERRUPT FAILED TO OCCUR/TIO
 BRANCH TO SENSE TEST
 TEST I/O COMMAND CODE
 SCW (BCW ADDRESS)
 BCW (ONE BYTE)
 BCW (BUF ADR)

```

```

00337C 41 3 0 C 3D2
003380 98 0 2 C 10C
003384 45 4 0 C 02C
003388 55 0 0 C 10C
00338C 47 8 0 C 396
003390 18 1 0
003392 99 00 1 000
003396 58 1 0 0 100
00339A 55 1 0 C 01C
00339E 47 8 0 C 3A6
0033A2 99 00 1 000
0033A6 58 1 0 0 114
0033AA 55 1 0 C 0F8
0033AE 47 8 0 C 386
0033B2 99 00 1 000
0033B6 58 1 0 C 0F4
0033BA 59 1 0 C 4C0
0033BE 47 8 0 C 3C6
0033C2 99 00 1 000
0033C6 91 7F 0 03B
0033CA 47 8 0 C 3DA
0033CE 99 00 C 3CE
0033D2 99 00 C 3D2
0033D6 47 F 0 C 3DA
0033DA 41 3 0 C 422
0033DE 98 0 2 C 100
0033E2 45 4 0 C 02C
0033E6 55 0 0 C 100
0033EA 47 8 0 C 3F4
0033EE 18 1 0
0033F0 99 00 1 000
0033F4 58 1 0 0 100
0033F8 55 1 0 C 018
0033FC 47 8 0 C 404
003400 99 00 1 000
003404 58 1 0 0 114
003408 55 1 0 C 0F8
00340C 47 8 0 C 414
003410 99 00 1 000
003414 48 1 0 C 124

```

```

*
* DATA TRANSFER COMMAND CHECKING (INTERRUPTS EXPECTED)
* (TEST I/O, SENSE, HOLD) (CC=0 AFTER)
*
SNSX01 LA R3,SNERRS PICKUP ERROR-STOP ADDRESS.
LM RD,R2,SENSX1 PICKUP SENSE I/O PACKET.
BAL R4,SIOMSH CALL MPX-SHARED I/O ROUTINE.
CL RD,SENSX1 CHECK FOR CAW = 00000004.
BC B,SNSCW BRANCH IF CAW IS OK.
LR R1,RO PICKUP CAW.
HPR O(R1)
SNSCW L R1,X'100'((,0) • DISPLAY ERRING CAW.
CL R1,SNBCW PICKUP CONSOLE SCW.
BC B,SNBCW COMPARE TO EXPECTED CAW.
HPR O(R1) BRANCH IF SCW IS OK.
SNBCW L R1,X'114'((,0) • DISPLAY BAD SCW.
CL R1,BPLS PICKUP CONSOLE BCW.
BC B,SNBUF COMPARE TO EXPECTED BCW
HPR O(R1) BRANCH IF BCW IS OK
SNBUF L R1,SNBUF • DISPLAY UNEXPECTED BCW
C R1,CHDREJ PICKUP DATA BUFFER
BC B,SNPSW CHECK FOR COMMAND REJ/ILL CMD
HPR O(R1) BRANCH IF ZERO
SNPSW TH OMSPSW+3(0),X'7F' • DISPLAY BAD BUFFER
BC B,HOLD01 CHECK FOR DEVICE 80 IN OLD PSW
HPR HPR BRANCH IF PROPER DEVICE IN PSW
SNERRS BC 15,HOLD01 • WRONG DEVICE # IN OLD M-S PSW
HPR HPR • SENSE FAILED TO INTERRUPT
BC LA R3,HLERR1 BRANCH TO NEXT TEST (HOLD)
HOLD01 LM RD,R2,HOLDX1 PICKUP ERROR-STOP ADDRESS
BAL R4,SIOMSH PICKUP HOLD I/O PACKET
CL RD,HOLDX1 CALL MPX-SHARED I/O ROUTINE
BC B,HLSCW CHECK CAW GOL TO 0000000F
LR R1,RO BRANCH IF CAW OK.
HPR O(R1) PICKUP CAW
HLSCW L R1,X'100'((,0) • DISPLAY UNEXPECTED CAW
CL R1,OUTSCW PICKUP CONSOLE SCW
BC B,HLBCW COMPARE TO XPT SCW (0C800114)
HPR O(R1) BRANCH IF OK.
HLBCW L R1,X'114'((,0) • UNEXPECTED SCW; DISPLAY IT
CL R1,BPLS PICKUP CONSOLE BCW
BC B,HLBUF COMPARE TO XPT BCW
HPR O(R1) BRANCH IF OK
HLBUF LM R1,ZERBX • DISPLAY BAD BCW
PICKUP I/O BUFFER

```

|        |                   |        |       |                                                 |                                  |
|--------|-------------------|--------|-------|-------------------------------------------------|----------------------------------|
| 003418 | 12 1 1            |        | LTR   | R1,R1                                           | CHECK IF STILL ZERO (EXPECTED)   |
| 00341A | 47 8 0 C 42A      |        | BC    | 8,MSLOOP                                        | BRANCH IF BUFFER IS OK           |
| 00341E | 99 00 1 000       |        | HPR   | 0(R1)                                           | • DISPLAY BAD BUFFER             |
| 003422 | 99 00 C 422       | HLERR1 | HPR   |                                                 | • HOLD FAILED TO CAUSE INTERRUPT |
| 003426 | 47 F 0 C 42A      |        | BC    | 15,MSLOOP                                       | TRY NEXT CHECK (DATA PATH)       |
|        |                   |        | BEGIN | CHECKING CONSOLE-MPX DATA PATHS VIA TURNAROUND  |                                  |
|        |                   |        |       |                                                 |                                  |
|        |                   |        |       | TRY SLIDING AND FULL BIT PATTERNS IN HOLD/SENSE |                                  |
|        |                   |        |       |                                                 |                                  |
| 00342A | 41 5 0 0 OFF      | MSLOOP | LA    | R5,255(,0)                                      | GET A CONSTANT FOR SNSBUF STORE  |
| 00342E | 41 7 0 C 128      |        | LA    | R7,SLIDEO                                       | PICKUP STARTING ADR OF DATA..    |
| 003432 | 17 9 9            |        | XR    | R9,R9                                           | CLEAR ALL OF R9 FOR COMPARES.    |
| 003434 | 41 8 0 0 012      |        | LA    | R8,18(,0)                                       | R8 COUNTS # OF BYTES OF DATA.    |
| 003438 | 43 9 0 7 000      | GETR9  | IC    | R9,0(,R7)                                       | R9 HOLDS CURRENT DATA BYTE...    |
| 00343C | 02 00 C 0F4 7 000 |        | MVC   | SNSBUF(1),0(R7)                                 | MOVE ONE BYTE OF DATA TO BUF..   |
| 003442 | 45 8 0 C 192      |        | BAL   | R11,HOLD1                                       | CALL MPX-SHARED HOLD I/O CMD     |
| 003446 | 42 5 0 C 0F4      |        | STC   | R5,SNSBUF                                       | STORE PATTERN OVER DATA BYTE.    |
| 00344A | 45 8 0 C 14C      |        | BAL   | B11,SENSE1                                      | CALL SENSE AND DATA RETURNS      |
| 00344E | 17 1 1            |        | XR    | R1,R1                                           | CLEAR R1 FOR COMPARE ON DATA     |
| 003450 | 43 1 0 C 0F4      |        | IC    | R1,SNSBUF                                       | PICKUP DATA BROUGHT IN/SENSE.    |
| 003454 | 19 1 9            |        | CR    | R1,R9                                           | COMPARE TO DATA SENT ON HOLD.    |
| 003456 | 47 8 0 C 45E      |        | BC    | 8,R9OK                                          | BRANCH IF TURNAROUND IS OK...    |
| 00345A | 99 00 0 000       |        | HPR   | 0(R13)                                          | • TURNAROUND ERROR! SHOW BYTE    |
| 00345E | 41 7 0 7 001      | R9OK   | LA    | R7,1(,R7)                                       | INCREMENT BYTE POINTER           |
| 003462 | 46 8 0 C 438      |        | BCT   | R8,GETR9                                        | BRANCH UNTIL ALL 18 PATTERNS OK  |
|        |                   |        |       |                                                 |                                  |
|        |                   |        |       | BEGIN CHECKING OUTPUT COMMAND (WRITE)           |                                  |
|        |                   |        |       |                                                 |                                  |
|        |                   |        |       | CHECK A WRITE COMMAND WITH THE T-FLAG SET       |                                  |
|        |                   |        |       |                                                 |                                  |
| 003466 | 41 4 0 C 476      | OUT1   | LA    | R4,OUT1A                                        | GET CHECKING ADDRESS             |
| 00346A | 98 0 2 C 4A8      |        | LM    | R0,R2,OUTPK1                                    | PICKUP WRITE PACKET              |
| 00346E | 45 3 0 C 02C      |        | BAL   | R3,S10MSH                                       | CALL SHARED I/O                  |
| 003472 | 99 00 C 472       |        | HPR   |                                                 | • NO INTERRUPT ON A WRITE        |
| 003476 | 55 0 0 C 4A8      | OUT1A  | CL    | R0,OUTPK1                                       | CHECK CAW FOR COMMAND            |
| 00347A | 47 8 0 C 482      |        | BC    | 8,OUT1B                                         | BRANCH IF CAW = 00000001         |
| 00347E | 99 00 C 47E       |        | HPR   |                                                 | • CAW IN ERR: NOT 00000001       |
| 003482 | 58 1 0 0 100      | OUT1B  | L     | R1,X'100'(,0)                                   | PICKUP SCW FOR CONSOLE           |
| 003486 | 55 1 0 C 018      |        | CL    | R1,OUTSCW                                       | COMPARE TO XPTD VALUE            |
| 00348A | 47 8 0 C 492      |        | BC    | 8,OUT1C                                         | BRANCH IF SCW IS OK              |
| 00348E | 99 00 1 000       |        | HPR   | 0(R1)                                           | • SHOW BAD SCW                   |
| 003492 | 58 1 0 0 114      | OUT1C  | L     | R1,X'114'(,0)                                   | PICKUP BCW FOR CONSOLE           |
| 003496 | 55 1 0 C 480      |        | CL    | R1,XBCWD                                        | COMPARE TO ORIGINAL BCW          |

|        |                   |        |     |                                                 |                                   |        |
|--------|-------------------|--------|-----|-------------------------------------------------|-----------------------------------|--------|
| 00349A | 47 8 0 C 576      |        | BC  | 8,OUT2                                          | BRANCH IF BCW NOT CHANGED         |        |
| 00349E | 99 00 1 000       |        | HPR | 0(R1)                                           | * BCW CHANGED WHEN T=FLAG=SET     |        |
| 0034A2 | 47 F 0 C 576      |        | BC  | 15,OUT2                                         | BRANCH TO NEXT CHECK              |        |
| 0034A6 | 0000              |        |     |                                                 |                                   |        |
| 0034A8 | 00000001          | OUTPK1 | DC  | F'1'                                            | OUTPUT WRITE COMMAND              |        |
| 0034AC | 00820114          | XSCW   | DC  | X'00820114'                                     | OUTPUT SCW (T=FLAG SET)           |        |
| 0034B0 | 0010              | XBCW0  | DC  | X'0010'                                         | OUTPUT BCW (ONE BYTE)             |        |
| 0034B2 | 34C4              |        | DC  | Y(OUTCR)                                        | OUTPUT BCW (CARRIAGE=RETURN)      |        |
| 0034B4 | 00000001          | OUTPK2 | DC  | F'1'                                            | WRITE COMMAND                     |        |
| 0034B8 | 00020114          |        | DC  | X'00020114'                                     | SCW: WRT FLAG, BCW ADDRESS        |        |
| 0034BC | 0010              |        | DC  | X'0010'                                         | BCW: ONE BYTE (CARRIAGE RETURN)   |        |
| 0034BE | 34C4              |        | DC  | Y(OUTCR)                                        | BCW: DATA BUFFER ADDRESS          |        |
| 0034C0 | 80000000          | CMDREJ | DC  | X'80000000'                                     | COMMAND=REJECT SENSE BYTE         |        |
| 0034C4 | 00                | OUTCR  | DC  | X'00'                                           | CARRIAGE RETURN                   | EBCDIC |
| 0034C5 | 25                | OUTLF  | DC  | X'25'                                           | LINE FEED                         | EBCDIC |
| 0034C6 | 40                | OUTSP  | DC  | X'40'                                           | SPACE                             | EBCDIC |
| 0034C7 | 37                | OUTEOM | DC  | X'37'                                           | EOM (END-OF=MESSAGE)              | EBCDIC |
| 0034C8 | 000034C5          | XBCW1  | DC  | A(OUTCR+1)                                      | BCW/CARRIAGE=RETURN               | X=BCW  |
| 0034CC | 000034C6          | XBCW2  | DC  | A(OUTLF+1)                                      | BCW/LINE FEED                     | X=BCW  |
| 0034D0 | 000034C8          | XBCW3  | DC  | A(OUTEOM+1)                                     | BCW/END-OF=MESSAGE                | X=BCW  |
| 0034D4 | C4D4D940 D4D7E760 | MPXMS1 | DC  | C'DMR MPX=SHARED I/O TEST '                     |                                   | 24     |
| 0034EC | 00250D25          | CR4A   | DC  | X'00250D25'                                     |                                   | 4      |
| 0034F0 | C1C2C3C4 C5C6C7C8 | ALPHAS | DC  | C'ABCDEFGHIJKLMN0PQRSTUVWXYZ                    |                                   | 32     |
| 003510 | F0F1F2F3 F4F5F6F7 | NUMBER | DC  | C'0123456789'                                   |                                   | 10     |
| 00351A | 00250D25          |        | DC  | X'00250D25'                                     |                                   | 4      |
| 00351E | D7D9C5E2 E240C1E3 | ATNMSG | DC  | C'PRESS ATTENTION KEY IF PRINT ABOVE IS OK'     |                                   | 40     |
| 003546 | 00250D25          |        | DC  | X'00250D25'                                     |                                   |        |
| 00354A | D7D9C5E2 E240C4C5 | DELMSG | DC  | C'PRESS DELETE KEY'                             |                                   | 16     |
| 00355A | 00250D25          |        | DC  | X'00250D25'                                     |                                   |        |
| 00355E | D7D9C5E2 E240C5D5 | EOMMSG | DC  | C'PRESS END-OF MESSAGE KEY'                     |                                   | 24     |
|        |                   | *      |     |                                                 |                                   |        |
|        |                   | *      |     | TRY A SINGLE-CHARACTER OUTPUT (CARRIAGE RETURN) |                                   |        |
|        |                   | *      |     |                                                 |                                   |        |
| 003576 | 41 4 0 C 586      | OUT2   | LA  | R4,OUT2A                                        | GET CC-CHECK ADDRESS              |        |
| 00357A | 98 0 2 C 4A8      |        | LM  | R0,R2,OUTPK1                                    | PICKUP I/O PACKET                 |        |
| 00357E | 45 3 0 C 02C      |        | BAL | R3,S10MSH                                       | CALL SHARED I/O                   |        |
| 003582 | 99 00 C 582       |        | HPR |                                                 | * NO INTERRUPT FOR WRITE C=R      |        |
| 003586 | 47 8 0 C 58E      | OUT2A  | BC  | 8,OUT2B                                         | BRANCH IF CC IS ZERO (OK)         |        |
| 00358A | 99 00 C 58A       |        | HPR |                                                 | * CC NOT 0 AFTER WRITE            |        |
| 00358E | 59 0 0 C 4A8      | OUT2B  | C   | R0,OUTPK1                                       | COMPARE CAW TO COMMAND            |        |
| 003592 | 47 8 0 C 59A      |        | BC  | 8,OUT2C                                         | BRANCH IF CAW IS OK (EQL)         |        |
| 003596 | 99 00 C 596       |        | HPR |                                                 | * CAW HAS WRONG VALUE AFTER WRITE |        |
| 00359A | 58 1 0 0 100      | OUT2C  | L   | R1,X'100' (,0)                                  | GET CONSOLE SCW                   |        |
| 00359E | 59 1 0 C 018      |        | C   | R1,OUTSCW                                       | COMPARE TO EXPECTED SCW           |        |

0035A2 47 8 0 C 5AA  
 0035A6 99 00 1 000  
 0035AA 58 1 0 0 114  
 0035AE 59 1 0 C 4B0  
 0035B2 47 8 0 C 58E  
 0035B6 99 00 1 000  
 0035BA 47 F 0 C 58E

0035BE 41 1 0 0 020  
 0035C2 42 1 0 C 000  
 0035C6 41 3 0 C 064  
 0035CA 41 4 0 C 068  
 0035CE 58 5 0 C 018  
 0035D2 41 6 0 C 546  
 0035D6 98 0 2 C 600  
 0035DA 45 8 0 C 02C  
 0035DE 41 1 0 C 5EA  
 0035E2 40 1 0 0 0BE  
 0035E6 58 1 0 C 00C  
 0035EA 91 80 0 100  
 0035EE 47 1 0 C 618  
 0035F2 46 1 0 C 5EA  
 0035F6 99 00 C 5F6  
 0035FA 47 F 0 C 618

0035FE 0000  
 003600 00000001  
 003604 00020114  
 003608 0720  
 00360A 3404  
 00360C 00000002  
 003610 00800114  
 003614 0010  
 003616 3010

003618 41 1 0 0 001  
 00361C 50 1 0 C 00C  
 003620 41 3 0 C 630  
 003624 98 0 2 C 60C  
 003628 45 4 0 C 02C  
 00362C 99 00 C 62C  
 003630 98 0 2 C 4A8

OUT2D

OUT3

TM1L1

MSG1

INPK1

OUT4

OUT4A

OUT4B

BC 8,OUT2D  
 HPR 0(R1)  
 L R1,X'114'(.0)  
 C R1,XBCWD  
 BC 8,OUT3  
 HPR 0(R1)  
 BC 15,OUT3

NOW...

LA R1,32(.0)  
 STC R1,WC+1  
 LA R3,MSHHPR  
 LA R4,MSHINT  
 L R5,OUTSCW  
 LA R6,DELMMSG-4  
 LM R0,R2,MSG1  
 BAL R11,S1OMSH  
 LA R1,TM1L1  
 STH R1,NMSPSW+6(.0)  
 L R1,WC  
 TM X'100'(.0),X'80'  
 BC 1,OUT4  
 BCT R1,TM1L1  
 HPR  
 BC 15,OUT4

DC F'1'  
 DC X'00020114'  
 DC X'0720'  
 DC Y(MPXMS1)  
 DC F'2'  
 DC X'00800114'  
 DC X'0010'  
 DC Y(TRYBUF)

LA R1,1(.0)  
 ST R1,WC  
 LA R3,OUT4B  
 LM R0,R2,INPK1  
 BAL R4,S1OMSH  
 HPR  
 LM R0,R2,OUTPK1

BRANCH IF SCW IS OK (EQUAL)  
 \* SCW HAS UNEXPECTED VALUE  
 GET BCW FOR CARRIAGE RETURN  
 COMPARE TO EXPECTED BCW  
 BRANCH IF BCW IS OK  
 \* UNEXPECTED BCW AFTER WRITE  
 BRANCH TO NEXT SEGMENT

CHECK ALPHABETIC / NUMERIC CHARACTERS AND ATTENTION KEY

GET EXPECTED BCW

GET TEST LOOP ADDRESS

GO TO NEXT SUBROUTINE AREA

WRITE COMMAND  
 NORMAL OUTPUT SCW  
 WRITE 72 BYTES (114 DECIMAL)  
 BUFFER ADDRESS FOR WRITE  
 READ COMMAND  
 SCW WITH T-FLAG SET  
 SINGLE BYTE (NOT READ)  
 BUFFER ADDRESS (TFLAG=NO READ)

```

003634 41 3 0 C 640
003638 45 4 0 C 02C
00363C 99 00 C 63C
003640 47 4 0 C 648
003644 99 00 C 644
003648 41 3 0 C 660
00364C 41 1 0 0 001
003650 42 1 0 C 00E
003654 98 0 1 C 118
003658 45 4 0 C 02C
00365C 99 00 C 65C
003660 47 4 0 C 668
003664 99 00 C 664
003668 59 0 0 C 688
00366C 47 8 0 C 674
003670 99 00 C 670
003674 58 1 0 0 100
003678 59 1 0 C 11C
00367C 47 8 0 C 6F8
003680 99 00 1 000
003684 47 F 0 C 6F8

```

```

003688 0C000003
00368C 00000001
003690 00020114
003694 0140
003696 3546
003698 00000001
00369C 00020114
0036A0 01C0
0036A2 355A
0036A4 00000001
0036A8 00020114
0036AC 0270
0036AE 3600
0036B0 00000002
0036B4 00000114
0036B8 0020
0036BA 3124
0036BC 00000114
0036C0 0020
0036C2 3124
0036C4 00000001
0036C8 00020114

```

```

OUT4C LA R3,OUT4C
BAL R4,SIOMSH
HPR
BC 4,OUT4D
HPR
OUT4D LA R3,OUT4E
LA R1,1(,0)
STC R1,WC+2
LM RD,R1,SHNOOP
BAL R4,SIOMSH
HPR
OUT4E BC 4,OUT4F
HPR
OUT4F C RD,NOPCAW
BC 8,OUT4G
HPR
OUT4G L R1,X'100'(,0)
C R1,SHNSCW
BC 8,DELKEY
HPR 0(R1)
BC 15,DELKEY
CNOP 0,8
NOPCAW DC X'0C000003'
DELPK1 DC X'00000001'
DC X'00020114'
DC X'0140'
DC Y(DELMMSG=4)
EOMPK1 DC F'1'
DC X'00020114'
DC X'01C0'
DC Y(EOMMSG=4)
TYPK1 DC F'1'
DC X'00020114'
DC X'0270'
DC Y(TYPMSG)
INPK2 DC F'2'
DC X'00000114'
DC X'0020'
DC Y(ZERBX)
DL1SCW DC X'0D000114'
DL1BCW DC X'0020'
DC Y(ZERBX)
CRLF DC F'1'
DC X'00020114'

```

- BRANCH IF CC IS OK
- CC NOT ONE (SHOULD BE)
- IS CAW OK ?
- BRANCH IF STATUS/CMD ARE OK
- STATUS/COMMAND IN CAW ARE BAD
- GET CONSOLE SCW
- IS SCW OK (NO-OP COMMAND)
- BRANCH IF SCW IS OK
- SCW NOT AT XPTD VALUE
- BRANCH TO DELETE-KEY TEST
- CAW EXPECTED AFTER A NO-OP
- DELETE-KEY MESSAGE

EOM-KEY MESSAGE

DATA-ENTRY MESSAGE

2-BYTE INPUT PACKET

DELETE-KEY SCW  
DELETE-KEY BCW  
DELETE-KEY BCW  
LINE-FEED / CARRIAGE RETURN

|        |                   |        |                     |                                  |
|--------|-------------------|--------|---------------------|----------------------------------|
| 0036CC | 0020              | DC     | X'0020'             |                                  |
| 0036CE | 34EC              | DC     | Y(CR4A)             |                                  |
| 0036DD | 0D25              | DC     | X'0D25'             | DATA-ENTRY REQUEST BUFFER        |
| 0036D2 | E3E8D7C5 40C3C8C1 | DC     | C'TYPE CHARACTERS ' |                                  |
| 0036E2 | C2C5E3E6 C5C5D540 | DC     | C'BETWEEN PARENS: ' |                                  |
| 0036F2 | 4D                | DC     | C'('                |                                  |
| 0036F3 | 404040            | DC     | C' '                |                                  |
| 0036F6 | 5D                | DC     | C')'                |                                  |
| 0036F7 | 00                |        |                     |                                  |
| 0036F8 | 41 1 0 0 009      | DELKEY | LA R1,9(,0)         | GET WAIT-COUNT CONSTANT          |
| 0036FC | 50 1 0 C 00C      | ST     | R1,WC               | CLEAR OLD VALUE OF COUNT         |
| 003700 | 42 1 0 C 00D      | STC    | R1,WC+1             | SET NEW COUNT IN BUFFER          |
| 003704 | 41 4 0 C 068      | LA     | R4,MSHINT           |                                  |
| 003708 | 58 5 0 C 018      | L      | R5,OUTSCW           |                                  |
| 00370C | 41 6 0 C 55A      | LA     | R6,EOMMSG-4         | GET EXPECTED BCW                 |
| 003710 | 41 3 0 C 064      | LA     | R3,MSHHPR           |                                  |
| 003714 | 98 0 2 C 68C      | LM     | R0,R2,DELPK1        |                                  |
| 003718 | 45 8 0 C 02C      | BAL    | R11,S1OMSH          | REQUEST OPERATOR TO PRESS        |
| 00371C | 41 4 0 C 72C      | LA     | R4,DEL1             | THE DELETE KEY                   |
| 003720 | 98 0 2 C 68D      | LM     | R0,R2,INPK2         |                                  |
| 003724 | 45 3 0 C 02C      | BAL    | R3,S1OMSH           |                                  |
| 003728 | 99 00 C 728       | HPR    |                     | SEND A READ COMMAND/DELETE KEY   |
| 00372C | 47 8 0 C 734      | DEL1   | BC 8,DEL2           | • NO INTERRUPT FROM DELETE KEY   |
| 003730 | 99 00 C 73D       | HPR    |                     | CHECK CC FOR STATUS STORED       |
| 003734 | 59 0 0 C 68D      | DEL2   | C                   | • CC NOT ZERO: NO STATUS STORED? |
| 003738 | 47 8 0 C 742      | BC     | R0,INPK2            | COMPARE CAW TO BASIC READ CMD    |
| 00373C | 18 1 0            | LR     | 8,DEL3              | BRANCH IF CAW IS OK (00000002)   |
| 00373E | 99 00 1 00D       | HPR    | R1,RO               | CAW HAS SOMETHING WIERD IN IT    |
| 003742 | 58 5 0 C 6BC      | DEL3   | O(R1)               | • DISPLAY WIERD CAW              |
| 003746 | 58 6 0 C 6CD      | L      | R5,DL1SCW           | PICKUP EXPECTED SCW              |
| 00374A | 45 8 0 C 068      | L      | R6,DL1BCW           | PICKUP EXPECTED BCW              |
| 00374E | 47 F 0 C 75C      | BAL    | R11,MSHINT          | CHECK SCW / BCW                  |
| 003752 | 0700              | BC     | 15,EOM1             | GO CHECK THE END-OF-MESSAGE KEY  |
| 003754 | 0C800114          | CNOP   | D,4                 |                                  |
| 003758 | 00003126          | INSCWZ | DC X'0C800114'      | GENERAL EXPECTED SCW             |
| 00375C | 41 4 0 C 068      | INBCWZ | DC A(1ZERBX+2)      | GENERAL EXPECTED BCW             |
| 003760 | 58 5 0 C 018      | EOM1   | LA R4,MSHINT        |                                  |
| 003764 | 41 6 0 C 576      |        | L R5,OUTSCW         |                                  |
| 003768 | 41 3 0 C 064      |        | LA R6,OUT2          |                                  |
| 00376C | 98 0 2 C 698      |        | LA R3,MSHHPR        |                                  |
| 003770 | 45 8 0 C 02C      |        | LM R0,R2,EOMPK1     |                                  |
| 003774 | 41 4 0 C 784      |        | BAL R11,S1OMSH      |                                  |
| 003778 | 98 0 2 C 68D      |        | LA R4,EM1           |                                  |
| 00377C | 45 3 0 C 02C      |        | LM R0,R2,INPK2      |                                  |
|        |                   |        | BAL R3,S1OMSH       |                                  |



003780 99 00 C 780  
 003784 47 8 0 C 78C  
 003788 99 00 C 788  
 00378C 59 0 0 C 680  
 003790 47 8 0 C 79A  
 003794 18 1 0  
 003796 99 00 1 000  
 00379A 58 5 0 0 100  
 00379E 58 6 0 0 114  
 0037A2 59 5 0 C 700  
 0037A6 47 8 0 C 7AE  
 0037AA 99 00 5 000  
 0037AE 59 6 0 C 7D4  
 0037B2 47 8 0 C 7BA  
 0037B6 99 00 6 000  
 0037BA 91 37 C 124  
 0037BE 47 1 0 C 7D8  
 0037C2 48 1 0 C 124  
 0037C6 99 00 1 000  
 0037CA 47 F 0 C 7D8  
 0037CE 0700  
 0037D0 0C000114  
 0037D4 0010  
 0037D6 3125  
 0037D8 41 4 0 C 068  
 0037DC 58 5 0 C 018  
 0037E0 41 6 0 C 6F7  
 0037E4 41 3 0 C 064  
 0037E8 02 01 C 6F3 C 85A  
 0037EE 98 0 2 C 6A4  
 0037F2 45 8 0 C 02C  
 0037F6 41 4 0 C 806  
 0037FA 98 0 2 C 680  
 0037FE 45 3 0 C 02C  
 003802 99 00 C 802  
 003806 47 8 0 C 80E  
 00380A 99 00 C 80A  
 00380E 59 0 0 C 680  
 003812 47 8 0 C 81C  
 003816 18 1 0  
 003818 99 00 1 000  
 00381C 98 5 6 C 754  
 003820 45 8 0 C 068  
 003824 91 F0 C 124

EM1 HPR BC 8,EM2  
 EM2 HPR C RD,INPK2  
 BC 8,EM3  
 LR R1,RO  
 HPR O(R1)  
 EM3 L R5,X'100'((,0)  
 L R6,X'114'((,0)  
 C R5,INSCWX  
 BC 8,EM4  
 HPR O(R5)  
 EM4 C R6,INBCWX  
 BC 8,EM5  
 HPR O(R6)  
 EM5 TM ZERBX,X'37'  
 BC 1,TYPIN  
 LM R1,ZERBX  
 HPR O(R1)  
 BC 15,TYPIN  
 CNOP 0,4  
 INSCWX DC X'0C000114'  
 INBCWX DC X'0010'  
 DC Y(ZERBX+1)  
 TYPIN LA R4,MSHINT  
 L R5,OUTSCW  
 LA R6,DELKEY=1  
 LA R3,MSHHPR  
 MVC TYBUF2(2),ZEROR  
 LM RD,R2,TYPK1  
 BAL B11,S10MSH  
 LA R4,TP1  
 LM RD,R2,INPK2  
 BAL R3,S10MSH  
 HPR  
 TP1 BC 8,TP2  
 HPR  
 TP2 C RD,INPK2  
 BC 8,TP3  
 LR R1,RO  
 HPR O(R1)  
 TP3 LM R5,R6,INSCWZ  
 BAL R11,MSHINT  
 TM ZERBX,X'F0'

EXPECTED SCW / EDM KEY CHECK  
 EXPECTED BCW / EDM KEY CHECK  
 EXPECTED BCW / EDM KEY CHECK

EXPECTED BCW AFTER I/O MESSAGE

003828 47 1 0 C 834  
 00382C 48 1 0 C 124  
 003830 99 00 1 000  
 003834 91 4F C 125  
 003838 47 1 0 C 844  
 00383C 48 1 0 C 124  
 003840 99 00 1 000  
 003844 05 01 C 124 C 85A  
 00384A 47 8 0 C 85E  
 00384E 48 1 0 C 124  
 003852 99 00 1 000  
 003856 47 F 0 C 85E  
 00385A F04F  
 00385C C54A  
 00385E D2 01 C 6F3 C 85C  
 003864 41 3 0 C 064  
 003868 41 4 0 C 068  
 00386C 58 5 0 C 018  
 003870 41 6 0 C 6F7  
 003874 98 0 2 C 6A4  
 003878 45 8 0 C 02C  
 00387C 41 4 0 C 88C  
 003880 98 0 2 C 680  
 003884 45 3 0 C 02C  
 003888 99 00 C 888  
 00388C 47 8 0 C 894  
 003890 99 00 C 890  
 003894 59 0 0 C 680  
 003898 47 8 0 C 8A2  
 00389C 18 1 0  
 00389E 99 00 1 000  
 0038A2 98 5 6 C 754  
 0038A6 45 8 0 C 068  
 0038AA 05 01 C 124 C 85C  
 0038B0 47 8 0 C 88C  
 0038B4 48 1 0 C 124  
 0038B8 99 00 1 000  
 0038BC 17 1 1  
 0038BE 50 1 0 C 124  
 0038C2 50 1 0 C 00C  
 0038C6 41 1 0 0 009  
 0038CA 42 1 0 C 000  
 0038CE 58 5 0 C 018  
 0038D2 41 6 0 C 9C4

TP4

TP5

ZEROR  
 ECENTS  
 TINZER

T11

T12

T13

TINONE

BC 1,TP4  
 LH R1,ZERBX  
 HPR O(R1)  
 TM ZERBX+1,X'4F'  
 BC 1,TP5  
 LH R1,ZERBX  
 HPR O(R1)  
 CLC ZERBX(2),ZEROR  
 BC 8,TINZER  
 LH R1,ZERBX  
 HPR O(R1)  
 BC 15,TINZER  
 DC X'F04F'  
 DC X'C54A'  
 MVC TYBUF2(2),ECENTS  
 LA R3,MSHHPR  
 LA R4,MSHINT  
 L R5,OUTSCW  
 LA R6,DELKEY=1  
 LM R0,R2,TYPK1  
 BAL B11,S10MSH  
 LA R4,T11  
 LM R0,R2,INPK2  
 BAL R3,S10MSH  
 HPR  
 BC 8,T12  
 HPR  
 C R0,INPK2  
 BC 8,T13  
 LR R1,R0  
 HPR O(R1)  
 LM R5,R6,INSCWZ  
 BAL R11,MSHINT  
 CLC ZERBX(2),ECENTS  
 BC 8,TINONE  
 LH R1,ZERBX  
 HPR O(R1)  
 XR R1,R1  
 ST R1,ZERBX  
 ST R1,WC  
 LA R1,9(,0)  
 STC R1,WC+1  
 L R5,OUTSCW  
 LA R6,MPXMSB

PATTERN / CHECK CLEARED BITS  
 PATTERN / CHECK SET BITS  
 TYPE IN ZERO-BIT CHECK

EXPECTED BCW AFTER I/O MESSAGE

BRANCH IF BUFFER IS OK

CHECK FOR 1-JAMMED IN INPUT

SETUP TIME=OUT COUNT

XPTD SCW  
 XPTD BCW

0038D6 41 4 0 C 068  
 0038DA 41 3 0 C 064  
 0038DE 98 0 2 C 980  
 0038E2 45 8 0 C 02C  
 0038E6 98 0 2 C 944  
 0038EA 41 6 0 C 125  
 0038EE 58 5 0 C 754  
 0038F2 41 3 0 C 064  
 0038F6 45 8 0 C 02C  
 0038FA 05 00 C 124 C 9A4  
 003900 47 8 0 C 908  
 003904 99 00 C 904  
 003908 58 5 0 C 018  
 00390C 41 6 0 C 9A4  
 003910 41 4 0 C 068  
 003914 41 3 0 C 064  
 003918 98 0 2 C 974  
 00391C 45 8 0 C 02C  
 003920 41 6 0 C 125  
 003924 58 5 0 C 754  
 003928 41 3 0 C 064  
 00392C 98 0 2 C 944  
 003930 45 8 0 C 02C  
 003934 95 40 C 124  
 003938 47 8 0 C 950  
 00393C 99 00 C 93C  
 003940 47 F 0 C 950  
 003944 00000002  
 003948 00000114  
 00394C 0010  
 00394E 3124

003950 17 1 1  
 003952 50 1 0 C 124  
 003956 58 5 0 C A10  
 00395A 41 6 0 C 9CF  
 00395E 41 4 0 C 068  
 003962 41 3 0 C 064  
 003966 98 0 2 C 9C4  
 00396A 45 8 0 C 02C  
 00396E 47 F 0 C B52

003972 0000  
 003974 00000001

INPKZ1

•  
EOMSH•  
T1PAK

LA R4,MSHINT  
 LA R3,MSHHPR  
 LM RD,R2,T2PAK  
 BAL B11,S1OMSH  
 LM RD,R2,INPKZ1  
 LA R6,ZERBX+1  
 L R5,INSCWZ  
 LA R3,MSHHPR  
 BAL R11,S1OMSH  
 CLC ZERBX(1),T2MSG  
 BC 8,\*+8  
 HPR  
 L R5,OUTSCW  
 LA R6,T2MSG  
 LA R4,MSHINT  
 LA R3,MSHHPR  
 LM RD,R2,T1PAK  
 BAL B11,S1OMSH  
 LA R6,ZERBX+1  
 L R5,INSCWZ  
 LA R3,MSHHPR  
 LM RD,R2,INPKZ1  
 BAL B11,S1OMSH  
 CLI ZERBX,X'40'  
 BC 8,EOMSH  
 HPR  
 BC 15,EOMSH  
 DC F'2'  
 DC X'00000114'  
 DC X'0010'  
 DC Y(ZERBX)

XR R1,R1  
 ST R1,ZERBX  
 L R5,BKSCW  
 LA R6,EOMSB+1  
 LA R4,MSHINT  
 LA R3,MSHHPR  
 LM RD,R2,MPXMSB  
 BAL B11,S1OMSH  
 BC 15,NSHSET

INT ADR  
 HPR ADR  
 I/O PKT  
 REQUEST CARRIAGE=RET  
 INP PKT (1=BYTE)  
 XPTD BCW  
 XPTW SCW  
 HPR ADR  
 READ ONE BYTE (C=R)  
 CHECK DATA IN ZERBX  
 BRANCH IF OK

• (NOT 00) INPUT FROM C=R BAD  
 XPT SCW

XPTD BCW  
 INT ADR  
 HPR ADR  
 I/O PKT

REQUEST ONE SPACE  
 XPT BCW  
 XPT SCW  
 HPR ADR  
 I/O PKT  
 READ ONE BYTE (SPACE)  
 CHECK BUFFER FOR CODE  
 BRANCH IF CODE IS OK

• BAD INPUT BYTE FOR SPACE (\*40)  
 BRANCH TO NEXT SEGMENT/MPX TEST  
 SINGLE-BYTE INPUT PACKET

SETUP END-OF-MPX=SH CONS MSG

SCW XPTD  
 BCW XPTD  
 INTERRUPT ADR  
 ERROR=STOP  
 I/O PACKET  
 PRINT THE MESSAGE  
 DONE WITH SHARED/START NON=SH

REQUEST ONE SPACE

|        |              |          |       |                                                     |                                 |
|--------|--------------|----------|-------|-----------------------------------------------------|---------------------------------|
| 003978 | 00020114     |          | DC    | X'00020114'                                         |                                 |
| 00397C | 0180         |          | DC    | X'0180'                                             |                                 |
| 00397E | 398C         |          | DC    | Y(T1MSG)                                            |                                 |
| 003980 | 00000001     | T2PAK    | DC    | F'1'                                                | REQUEST A CARRIAGE RETURN       |
| 003984 | 00020114     |          | DC    | X'00020114'                                         |                                 |
| 003988 | 0200         |          | DC    | X'0200'                                             |                                 |
| 00398A | 39A4         |          | DC    | Y(T2MSG)                                            |                                 |
| 00398C | 0D25         | T1MSG    | DC    | X'0D25'                                             | DATA-BUFFER                     |
| 00398E | E3E807C5     | 40C9D540 | DC    | C'TYPE IN TWO SPACES'                               | DATA BUFFER                     |
| 0039A0 | 0D0D2525     |          | DC    | X'0D0D2525'                                         | DATA-BUFFER                     |
| 0039A4 | 0D25         | T2MSG    | DC    | X'0D25'                                             | DATA-BUFFER                     |
| 0039A6 | E3E807C5     | 40C9D540 | DC    | C'TYPE IN 2 CARRIAGE RETURNS'                       |                                 |
| 0039C0 | 0D0D0D25     |          | DC    | X'0D0D0D25'                                         | DATA-BUFFER                     |
| 0039C4 | 00000001     | MPXMSB   | DC    | F'1'                                                |                                 |
| 0039C8 | 00060114     |          | DC    | X'00060114'                                         |                                 |
| 0039CC | 0340         |          | DC    | X'0340'                                             |                                 |
| 0039CE | 3A03         | EOMSB    | DC    | Y(MPXBF2+3)                                         |                                 |
| 0039D0 | 250D4BE3     |          | DC    | X'250D4BE3'                                         | WRITE-BACKWARDS DATA BUFFER     |
| 0039D4 | E2C5E340     |          | DC    | X'E2C5E340'                                         |                                 |
| 0039D8 | C4C5D9C1     |          | DC    | X'C4C5D9C1'                                         | (FOR END MPX=SHARED MESSAGE)    |
| 0039DC | C8E260D5     |          | DC    | X'C8E260D5'                                         |                                 |
| 0039E0 | D6D540D5     |          | DC    | X'D6D540D5'                                         |                                 |
| 0039E4 | C9C7C5C2     |          | DC    | X'C9C7C5C2'                                         |                                 |
| 0039E8 | 250D250D     |          | DC    | X'250D250D'                                         |                                 |
| 0039EC | 407AE3E2     |          | DC    | X'407AE3E2'                                         |                                 |
| 0039F0 | C5E340C4     |          | DC    | X'C5E340C4'                                         |                                 |
| 0039F4 | C5D9C1C8     |          | DC    | X'C5D9C1C8'                                         |                                 |
| 0039F8 | E260E7D7     |          | DC    | X'E260E7D7'                                         |                                 |
| 0039FC | D44DC6D6     |          | DC    | X'D44DC6D6'                                         |                                 |
| 003A00 | 40C4D5C5     | MPXBF2   | DC    | X'40C4D5C5'                                         |                                 |
| 003A04 | 00000007     | GONSH    | DC    | F'7'                                                | SELECT NON-SHARED ADR COMMAND   |
| 003A08 | 00820114     |          | DC    | X'00820114'                                         |                                 |
| 003A0C | 0010         |          | DC    | X'0010'                                             |                                 |
| 003A0E | 3124         |          | DC    | Y(ZERBX)                                            |                                 |
| 003A10 | 0C860114     | BKSCW    | DC    | X'0C860114'                                         | EXPECTED SCW/WRITE BACKWARDS    |
|        |              | *        |       |                                                     |                                 |
|        |              | *        | CHECK | ALL STATUS AND BCW LOCATIONS FOR IMMEDIATE COMMANDS |                                 |
|        |              | *        |       |                                                     |                                 |
| 003A14 | 47 4 0 C A1C | NSIMM    | BC    | 4,NSCCOK                                            | CONDITION CODE SHOULD BE 1      |
| 003A18 | 99 00 B 000  |          | HPR   | 0(R11)                                              | * BAD CC                        |
| 003A1C | 19 0 5       | NSCCOK   | CR    | R0,R5                                               | * R5 HAS EXPECTED CAW (STA/CHD) |
| 003A1E | 47 8 0 C A26 |          | BC    | 8,NCAWOK                                            |                                 |
| 003A22 | 99 00 B 000  |          | HPR   | 0(R11)                                              | * BAD CAW                       |
| 003A26 | 59 1 0 0 200 | NCAWOK   | C     | R1,S12(,D)                                          | * SCW SHOULD NOT CHANGE AT ALL  |

|        |                   |        |     |                 |                                  |
|--------|-------------------|--------|-----|-----------------|----------------------------------|
| 003A2A | 47 8 0 C A32      |        | BC  | 8,NSCWOK        |                                  |
| 003A2E | 99 00 B 000       |        | HPR | 0(R11)          | • BAD SCW                        |
| 003A32 | 59 2 0 0 114      | NSCWOK | C   | R2,276(,0)      | • BCW SHOULD NOT CHANGE AT ALL   |
| 003A36 | 47 8 0 C A3E      |        | BC  | 8,CKSSCW        |                                  |
| 003A3A | 99 00 B 000       |        | HPR | 0(R11)          | • BAD BCW                        |
| 003A3E | 50 1 0 C ADO      | CKSSCW | ST  | R1,NTEMP        |                                  |
| 003A42 | 41 1 0 C AE4      |        | LA  | R1,STBCW2       |                                  |
| 003A46 | 59 1 0 0 180      |        | C   | R1,X'180'(,0)   | STATUS TABLE SCW DOESNT CHANGE   |
| 003A4A | 58 1 0 C ADO      |        | L   | R1,NTEMP        |                                  |
| 003A4E | 47 8 0 C A56      |        | BC  | 8,CKSBCW        |                                  |
| 003A52 | 99 00 B 000       |        | HPR | 0(R11)          | • BAD STA                        |
| 003A56 | 05 03 C AE4 C AEC | CKSBCW | CLC | STBCW2(4),STBCW | • STATUS TABLE BCW DOESNT CHANGE |
| 003A5C | 47 8 0 C A64      |        | BC  | 8,CKTBLS        |                                  |
| 003A60 | 99 00 B 000       |        | HPR | 0(R11)          | • BAD STA                        |
| 003A64 | 05 07 C DEC C AF8 | CKTBLS | CLC | TABLE(8),ALLOD  | • SHOULD NOT STORE IN STATUS TBL |
| 003A6A | 07 8 B            |        | BCR | 8,R11           | EXIT IF ALL OK.                  |
| 003A6C | 99 00 B 000       |        | HPR | 0(R11)          | • BAD STA                        |
| 003A70 | 07 F B            |        | BCR | 15,R11          | EXIT.                            |

## EJECT

MULTIPLEX CHANNEL NON-SHARED I/O SUBROUTINE ;

ENTER WITH R0 = CONSOLE COMMAND

R1 = CONSOLE SCW (FLAGS, BCW ADDRESS)

R2 = CONSOLE BCW (BYTE COUNT DATA ADDRESS)

R3 = ADDRESS TO GO TO IF NO INTERRUPT OCCURS

R4 = ADDRESS TO GO TO IF AN INTERRUPT OCCURS

NOTE IF R4 IS ZERO AN INTERRUPT GOES TO NSHINT.

```

003A72 90 0 3 C AD4
003A76 50 1 0 0 200
003A7A 50 2 0 0 114
003A7E 02 07 0 0C8 C AFO
003A84 41 3 0 C AE4
003A88 50 3 0 0 180
003A8C 02 03 C AE4 C AEC
003A92 02 07 C DEC C AF8
003A98 98 0 3 C AD4
003A9C 54 3 0 C 004
003AAD 56 3 0 C 008
003AA4 40 3 0 C ACC
003AA8 12 4 4
003AAA 47 8 0 C AB2
003AAE 40 4 0 0 0CE
003AB2 80 00 C AFO
003AB6 9C 00 0 080
003ABA 50 1 0 C ADO
003ABE 58 1 0 C 00C
003AC2 46 1 0 C AC2
003AC6 58 1 0 C ADD
003ACA 47 F 0 C ACA
003ACE 0000
003AD0 00000000
003AD4 00000000
00000000
00000000
00000000
00000000
003AE4 00000000
00000000
003AEC 0010

```

NSHSIO

STM

R0,R3,NSHBUF

SAVE REGISTERS AT ENTRY.

ST

R1,512(,0)

X=200= IS NON-SHARED SCW

ST

R2,276(,0)

X=114= IS NON-SHARED BCW

MVC

NMNPSW(8,0),NSHPSW

R0 IS CONSOLE COMMAND

LA

R3,STBCW2

GET STATUS TABLE BCW ADDRESS

ST

R3,X'180'(,0)

STORE THE BCW ADDRESS IN SCW

MVC

STBCW2(4),STBCW

MOVE CORRECT VALUES INTO BCW

MVC

TABLE(8),ALLOD

CLEAR THE STATUS TABLE TO ZERO

LM

R0,R3,NSHBUF

RESTORE R0-R3 TO ORIGINAL VALUE

N

R3,CONS1

R3=NO INTERRUPT EXIT ADDRESS

O

R3,CONS2

AND=R3 TO GET D-FIELD/OR IN B

STM

R3,LOOP2+2

STORE R3 IN EXIT INSTRUCTION

LTR

R4,R4

R4 IS ADR TO INTERRUPT TO.

BC

8,\*+8

BRANCH IF NO ADDRESS (R4=0)

STM

R4,NMNPSW+6(,0)

STORE THE INTERRUPT ADR(PSW)

SSM

NSHPSW

ALLOW I/O INTERRUPTS NOW

SIO

X'80'(0)

START I/O ON CONSOLE,CHANNEL 02

ST

R1,NTEMP

SAVE R1 FOR LATER CHECKS

L

R1,WC

GET A COUNT TO DECREMENT (WAIT)

BCT

R1,\*

TEST FOR ZERO,(NOT=COUNT DOWN)

L

R1,NTEMP

RESTORE R1 TO INCOMING VALUE

BC

15,\*

BRANCH TO NO-INTERRUPT ADDRESS

LOOP2

NTEMP

DC

F'0'

TEMP STORAGE FOR NON-SHARED TST

NSHBUF

DC

4F'0'

STORAGE FOR R0/R1/R2/R3 NSHSIO

STBCW2

DC

2F'0'

LOCATION OF STA BCW

STBCW

DC

X'0010'

VALUE FOR STATUS BCW



```

003B72 47 4 0 C B7A
003B76 99 00 C B76
003B7A 18 1 0
003B7C 59 1 0 C C38
003B80 47 8 0 C B88
003B84 99 00 1 000
003B88 58 1 0 0 100
003B8C 59 1 0 C A08
003B90 47 8 0 C B98
003B94 99 00 1 000
003B98 58 1 0 0 114
003B9C 59 1 0 C A0C
003BA0 47 8 0 C BAC
003BA4 99 00 1 000
003BA8 47 F 0 C BAC

```

```

003BAC 98 0 2 C 118
003BB0 41 3 0 C A14
003BB4 58 5 0 C 688
003BB8 02 03 C 00C c 008
003BBE 41 8 0 C BCA
003BC2 45 4 0 C A72
003BC6 99 00 C BC6
003BCA 98 0 2 C 308
003BCE 58 5 0 C 314
003BD2 41 8 0 C BDE
003BD6 45 4 0 C A72
003BDA 99 00 C BDA
003BDE 58 5 0 C 370
003BE2 41 3 0 C BF2
003BE6 98 0 2 C 370
003BEA 45 4 0 C A72
003BEE 99 00 C BEE
003BF2 41 8 0 C C3C
003BF6 47 8 0 C A1C
003BFA 99 00 C BFA
003BFE 47 F 0 C A1C
003C02 0000
003C04 00000000
003C08 00003C30
003C0C 04000000
003C10 00003C28
003C14 FF00
003C16 30F0

```

```

NSHX01 BC 4,NSHX01
HPR LR R1,RO
C R1,NSCAW1
BC 8,NSHX02
HPR 0(R1)
NSHX02 L R1,256(,0)
C R1,GONSH+4
BC 8,NSHX03
HPR 0(R1)
NSHX03 L R1,276(,0)
C R1,GONSH+8
BC 8,NSNOP1
HPR 0(R1)
BC 15,NSNOP1
*
NSNOP1 LM R0,R2,SHNOOP
LA R3,NSIMM
L R5,NOPCAW
MVC WC(4),CONS2
LA R11,NSILL
BAL R4,NSHS10
HPR
NSILL LM R0,R2,ILLCH1
L R5,CM8CAW
LA R11,NST10
BAL R4,NSHS10
HPR
NST10 L R5,TIOPAK
LA R3,NST101
LM R0,R2,TIOPAK
BAL R4,NSHS10
HPR
NST101 LA R11,NSENSE
BC 8,NSCCOK
HPR
BC 15,NSCCOK
SHERR DC F'0'
DC A(NSINT1)
NONSHR DC X'04000000'
DC A(NSINT1)
SXPBCW DC X'FFD0'
DC Y(TABLE+4)

```

```

BRANCH IF CC IS OK (SHOULD=1)
• CONDITION CODE NOT 1 (IMM CMD)
GET CAW
GET EXPECTED CAW
BRANCH IF STATUS/CMD OK IN CAW
• STATUS OR CMD IN CAW IS BAD
GET SCW
COMPARE TO EXPECTED SCW
BRANCH IF SCW IS OK (UNCHANGED)
• SCW CHANGED DURING IMM-COMMAND
GET BCW
GET XPT BCW
BRANCH IF BCW OK (UNCHANGED)
• BCW CHANGED DURING IMM-COMMAND
BRANCH TO NO-OP CHECK

GET NO-OP CAW/SCW/BCW
IMMEDIATE STATUS CHK ADRS
EXPECTED CAW
WAIT COUNT = 4000
NEXT TEST ADDRESS
CALL I/O SUBROUTINE
• NO-OP CMD CAUSED INTERRUPT
GET ILLEGAL CMD CAW/SCW/BCW
EXPECTED CAW
NEXT TEST ADDRESS
CALL I/O SUBROUTINE
• ILLEGAL CMD INTERRUPTED (IMM)
EXPECTED CAW
NEXT CHECK ADDRESS
TEST I/O CAW/SCW/BCW
CALL I/O SUBROUTINE
• TEST I/O CMD INTERRUPTED (IMM)
ADDRESS OF NEXT TEST
BRANCH IF CC IS OK (XPT ZERO)
• CC NOT ZERO AFTER TEST I/O (NS)
BRANCH TO MORE CHECKS ON T=I/O

PSW (NO INTERRUPTS EXPECTED)
PSW (NO INTERRUPTS EXPECTED)
PSW (NO INTERRUPTS EXPECTED)
PSW (NO INTERRUPTS EXPECTED)
EXPECTED STATUS TABLE BCW
EXPECTED STATUS TABLE BCW

```



003C18 00000C00  
 003C1C 00000000  
 003C20 00820114  
 003C24 00800114  
 003C28 48 1 0 0 03E  
 003C2C 99 00 1 000  
 003C30 48 1 0 0 04E  
 003C34 99 00 1 000  
 003C38 0C000007

003C3C 41 B 0 C C6C  
 003C40 58 5 0 C 10C  
 003C44 58 6 0 C C24  
 003C48 17 4 4  
 003C4A 17 9 9  
 003C4C 50 9 0 C 0F4  
 003C50 41 1 0 0 001  
 003C54 40 1 0 C 00C  
 003C58 41 7 0 C C14  
 003C5C 41 8 0 C C18  
 003C60 98 0 2 C 10C  
 003C64 45 3 0 C A72  
 003C68 99 00 C C68  
 003C6C 58 1 0 0 114  
 003C70 59 1 0 C 0F8  
 003C74 47 8 0 C C7C  
 003C78 99 00 C C78  
 003C7C 58 1 0 C 0F4  
 003C80 59 1 0 C 4C0  
 003C84 47 8 0 C C90  
 003C88 99 00 C C88  
 003C8C 47 F 0 C C90  
 003C90 41 8 0 C C88  
 003C94 41 5 0 0 00F  
 003C98 58 6 0 C C20  
 003C9C 17 4 4  
 003C9E 17 9 9  
 003CA0 50 9 0 C 0F4  
 003CA4 41 7 0 C C14  
 003CA8 41 8 0 C C18  
 003CAC 98 0 2 C 100  
 003CB0 45 3 0 C A72

SXPTBL DC X'00000C00'  
 DC X'00000000'  
 NXSCW2 DC X'00820114'  
 NXSCW DC X'00800114'  
 MSINT1 LH R1,0MSPSW+6(,0)  
 HPR 0(R1)  
 NSINT1 LH R1,0MNPSW+4(,0)  
 HPR 0(R1)  
 NSCAW1 DC X'0C000007'

•  
 • NON-SHARED SENSE COMMAND (PRELIMINARY TEST)  
 •

NSENSE LA R11,NSNS2  
 L R5,SENSX1  
 L R6,NXSCW  
 XR R4,R4  
 XR R9,R9  
 ST R9,SNSBUF  
 LA R1,1(,0)  
 STH R1,WC  
 LA R7,SXPBCW  
 LA R8,SXPTBL  
 LM R0,R2,SENSX1  
 BAL R3,NSHS10  
 HPR  
 NSNS2 L R1,276(,0)  
 C R1,BPLS  
 BC 8,NS1BUF  
 HPR  
 NS1BUF L R1,SNSBUF  
 C R1,CMDREJ  
 BC 8,NHOLD  
 HPR  
 NHOLD BC 15,NHOLD  
 LA R11,NHLD2  
 LA R5,15(,0)  
 L R6,NXSCW2  
 XR R4,R4  
 XR R9,R9  
 ST R9,SNSBUF  
 LA R7,SXPBCW  
 LA R8,SXPTBL  
 LM R0,R2,HOLDX1  
 BAL R3,NSHS10

EXPECTED STATUS TABLE CONTENTS  
 EXPECTED STATUS TABLE CONTENTS  
 NON-SHARED XPTD SCW  
 NON-SHARED XPTD SCW  
 UNEXPECTED INTERRUPT  
 SHOW ADR  
 UNEXPECTED INTERRUPT  
 SHOW ADR  
 EXPECTED CAW FOR

ADDRESS OF NEXT TEST (BCW CHK)  
 EXPECTED CAW  
 PICKUP EXPECTED SCW

CLEAR INPUT BUFFER

SET WAIT COUNT = 00010000

XPT STATUS TABLE BCW

XPT STATUS TABLE

PICKUP SENSE I/O PACKET NOW

CALL NON-SHARED I/O ROUTINE

• INTERRUPT FAILED TO OCCUR

GET BCW

BRANCH IF BCW IS OK

BRANCH IF BCW IS OK

• UNEXPECTED BCW FROM SENSE CMD

GET SENSE DATA

SHOULD CONTAIN ILLEGAL CMD BIT

NEXT TEST IS HOLD COMMAND

• UNEXPECTED DATA FROM SENSE

BRANCH TO HOLD-COMMAND TEST

ADDRESS OF BCW/BUFFER CHECK

EXPECTED CAW = 0000000F

PICKUP EXPECTED SCW (OUTPUT)

R4=0 MEANS GOTO NSHINT

R9=USED TO CLEAR DATA

CLEAR DATA BUFFER

ADDRESS OF XPTD STATUS TBL BCW

ADDRESS OF XPTD STATUS TBL

GET HOLD COMMAND

CALL NON-SHARED I/O ROUTINE

|                                  |                   |        |      |                        |  |                             |
|----------------------------------|-------------------|--------|------|------------------------|--|-----------------------------|
| 003CB4                           | 99 00 C CB4       |        | HPR  |                        |  |                             |
| 003CB8                           | 58 1 0 0 114      | NHLD2  | L    | R1,276(,0)             |  |                             |
| 003CBC                           | 59 1 0 C 0F8      |        | C    | R1,BPLS                |  |                             |
| 003CC0                           | 47 8 0 C CC8      |        | BC   | 8,NHIBUF               |  |                             |
| 003CC4                           | 99 00 1 000       |        | HPR  | 0(R1)                  |  |                             |
| 003CC8                           | D5 03 C 0F4 C 370 | NHIBUF | CLC  | SNSBUF(4),TIOPAK       |  |                             |
| 003CCE                           | 47 8 0 C DAO      |        | BC   | 8,NDATA                |  |                             |
| 003CD2                           | 99 00 C CD2       |        | HPR  |                        |  |                             |
| 003CD6                           | 47 F 0 C DAO      |        | BC   | 15,NDATA               |  |                             |
| • NO INTERRUPT FOR HOLD CMD (NS) |                   |        |      |                        |  |                             |
| GET BCW                          |                   |        |      |                        |  |                             |
| SHOULD BE EQUAL A(SNSBUF+1)      |                   |        |      |                        |  |                             |
| BRANCH=OK/ELSE SHOW BAD BCW.     |                   |        |      |                        |  |                             |
| • UNEXPECTED BCW FOR HOLD CMD    |                   |        |      |                        |  |                             |
| COMPARE BUFFER TO WORD=ZERO      |                   |        |      |                        |  |                             |
| BRANCH TO NEXT TEST (NO ERROR)   |                   |        |      |                        |  |                             |
| • DATA CHANGED DURING HOLD CMD   |                   |        |      |                        |  |                             |
| BRANCH TO NEXT TEST AFTER ERROR  |                   |        |      |                        |  |                             |
| 003CDA                           | 0000              |        |      |                        |  |                             |
| 003CDC                           | 00000001          | FIN    | DC   | F'1'                   |  | WRITE COMMAND               |
| 003CE0                           | 0004              |        | DC   | X'0006'                |  | SCW: W/D FLAGS SET          |
| 003CE2                           | 3CE4              |        | DC   | Y(FINBCW)              |  | SCW: BCW ADDRESS            |
| 003CE4                           | 0044              | FINBCW | DC   | X'0044'                |  | BCW=4 BYTES THEN CHAIN      |
| 003CE6                           | 3A03              |        | DC   | Y(MPXBF2+3)            |  | BCW= DATA ADDRESS           |
| 003CE8                           | 0008              |        | DC   | X'0008'                |  | BCW= NO BYTES; LINK         |
| 003CEA                           | 3CF0              |        | DC   | Y(LINKSL)              |  | BCW= LINK ADDRESS           |
| 003CEC                           | 00C0              |        | DC   | X'00C0'                |  | BCW= NO LINK ;              |
| 003CEE                           | 3D2F              |        | DC   | Y(CHLINK)              |  | BCW= ERROR MSG              |
| 003CF0                           | 0064              | LINKSL | DC   | X'0064'                |  | BCW= LINK OK=SEND           |
| 003CF2                           | 39FF              |        | DC   | Y(MPXBF2-1)            |  | BCW= REST OF MSG            |
| 003CF4                           | 000C              | BCWEND | DC   | X'000C'                |  | BCW= STOP IMM CODE          |
| 003CF6                           | 3CF8              |        | DC   | Y(STOPIT)              |  | BCW= ADR IF FAILS           |
| 003CF8                           | 0280              | STOPIT | DC   | X'0280'                |  | BCW= ERROR MSG!             |
| 003CFA                           | 3D23              |        | DC   | Y(STOPEM)              |  | BCW= ERROR! NO STOP         |
| •                                |                   |        |      |                        |  |                             |
| 003CFC                           | C8C3E3C9 E6E240D7 | C      | DC   | C'NCTINS POTS SSERP    |  | ERROR MSG / STOP IMMEDIATE  |
| 003D0F                           | 7AD9D6D9 D9C540C5 |        | DC   | C'RRORRE ETAIDEMMI POT |  | ERROR MSG / ERROR;PRESS     |
| 003D23                           | E2                | STOPEM | DC   | C'S'                   |  | ERROR MSG / STOP SWITCH     |
| 003D24                           | C4C1C240 E2C940D2 |        | DC   | C'DAB SI KNIL'         |  | ERROR MSG / LINK IS BAD     |
| 003D2F                           | 40                | CHLINK | DC   | C' '                   |  | ERROR MSG /                 |
| •                                |                   |        |      |                        |  |                             |
| 003D30                           | 0004              | BCWNOX | CNOP | 0,4                    |  | BCW1 : CHAIN FLAG           |
| 003D32                           | 39FF              |        | DC   | X'0004'                |  |                             |
| 003D34                           | FFF8              |        | DC   | Y(MPXBF2-1)            |  | BCW 2 : LINK FLAG           |
| 003D36                           | 3CF0              |        | DC   | X'FFF8'                |  |                             |
| 003D38                           | 0004              |        | DC   | Y(LINKSL)              |  | BCW 3 : CHAIN FLAG          |
| 003D3A                           | 39F9              |        | DC   | X'0004'                |  |                             |
| 003D3C                           | FFFC              |        | DC   | Y(MPXBF2-7)            |  | BCW 4 : STOP IMMEDIATE FLAG |
| 003D3E                           | 3CF8              |        | DC   | X'FFFC'                |  |                             |
| 003D40                           | 00000001          | TIMERS | DC   | Y(STOPIT)              |  |                             |
| 003D44                           | 00020114          |        | DC   | F'1'                   |  | WRITE COMMAND               |
| 003D48                           | 0240              |        | DC   | X'00020114'            |  | W-FLAG IS SET               |
|                                  |                   |        |      | X'0240'                |  | 36 CHARACTERS               |

6-115

| Address | Hex | Op | OpC | OpD | OpE | OpF | OpG | OpH | OpI | OpJ | OpK | OpL | OpM | OpN | OpO | OpP | OpQ | OpR | OpS | OpT | OpU | OpV | OpW | OpX | OpY | OpZ | OpAA | OpAB | OpAC | OpAD | OpAE | OpAF | OpAG | OpAH | OpAI | OpAJ | OpAK | OpAL | OpAM | OpAN | OpAO | OpAP | OpAQ | OpAR | OpAS | OpAT | OpAU | OpAV | OpAW | OpAX | OpAY | OpAZ | OpBA | OpBB | OpBC | OpBD | OpBE | OpBF | OpBG | OpBH | OpBI | OpBJ | OpBK | OpBL | OpBM | OpBN | OpBO | OpBP | OpBQ | OpBR | OpBS | OpBT | OpBU | OpBV | OpBW | OpBX | OpBY | OpBZ | OpCA | OpCB | OpCC | OpCD | OpCE | OpCF | OpCG | OpCH | OpCI | OpCJ | OpCK | OpCL | OpCM | OpCN | OpCO | OpCP | OpCQ | OpCR | OpCS | OpCT | OpCU | OpCV | OpCW | OpCX | OpCY | OpCZ | OpDA | OpDB | OpDC | OpDD | OpDE | OpDF | OpDG | OpDH | OpDI | OpDJ | OpDK | OpDL | OpDM | OpDN | OpDO | OpDP | OpDQ | OpDR | OpDS | OpDT | OpDU | OpDV | OpDW | OpDX | OpDY | OpDZ | OpEA | OpEB | OpEC | OpED | OpEE | OpEF | OpEG | OpEH | OpEI | OpEJ | OpEK | OpEL | OpEM | OpEN | OpEO | OpEP | OpEQ | OpER | OpES | OpET | OpEU | OpEV | OpEW | OpEX | OpEY | OpEZ | OpFA | OpFB | OpFC | OpFD | OpFE | OpFF | OpFG | OpFH | OpFI | OpFJ | OpFK | OpFL | OpFM | OpFN | OpFO | OpFP | OpFQ | OpFR | OpFS | OpFT | OpFU | OpFV | OpFW | OpFX | OpFY | OpFZ | OpGA | OpGB | OpGC | OpGD | OpGE | OpGF | OpGG | OpGH | OpGI | OpGJ | OpGK | OpGL | OpGM | OpGN | OpGO | OpGP | OpGQ | OpGR | OpGS | OpGT | OpGU | OpGV | OpGW | OpGX | OpGY | OpGZ | OpHA | OpHB | OpHC | OpHD | OpHE | OpHF | OpHG | OpHH | OpHI | OpHJ | OpHK | OpHL | OpHM | OpHN | OpHO | OpHP | OpHQ | OpHR | OpHS | OpHT | OpHU | OpHV | OpHW | OpHX | OpHY | OpHZ | OpIA | OpIB | OpIC | OpID | OpIE | OpIF | OpIG | OpIH | OpII | OpIJ | OpIK | OpIL | OpIM | OpIN | OpIO | OpIP | OpIQ | OpIR | OpIS | OpIT | OpIU | OpIV | OpIW | OpIX | OpIY | OpIZ | OpJA | OpJB | OpJC | OpJD | OpJE | OpJF | OpJG | OpJH | OpJI | OpJJ | OpJK | OpJL | OpJM | OpJN | OpJO | OpJP | OpJQ | OpJR | OpJS | OpJT | OpJU | OpJV | OpJW | OpJX | OpJY | OpJZ | OpKA | OpKB | OpKC | OpKD | OpKE | OpKF | OpKG | OpKH | OpKI | OpKJ | OpKK | OpKL | OpKM | OpKN | OpKO | OpKP | OpKQ | OpKR | OpKS | OpKT | OpKU | OpKV | OpKW | OpKX | OpKY | OpKZ | OpLA | OpLB | OpLC | OpLD | OpLE | OpLF | OpLG | OpLH | OpLI | OpLJ | OpLK | OpLL | OpLM | OpLN | OpLO | OpLP | OpLQ | OpLR | OpLS | OpLT | OpLU | OpLV | OpLW | OpLX | OpLY | OpLZ | OpMA | OpMB | OpMC | OpMD | OpME | OpMF | OpMG | OpMH | OpMI | OpMJ | OpMK | OpML | OpMM | OpMN | OpMO | OpMP | OpMQ | OpMR | OpMS | OpMT | OpMU | OpMV | OpMW | OpMX | OpMY | OpMZ | OpNA | OpNB | OpNC | OpND | OpNE | OpNF | OpNG | OpNH | OpNI | OpNJ | OpNK | OpNL | OpNM | OpNN | OpNO | OpNP | OpNQ | OpNR | OpNS | OpNT | OpNU | OpNV | OpNW | OpNX | OpNY | OpNZ | OpOA | OpOB | OpOC | OpOD | OpOE | OpOF | OpOG | OpOH | OpOI | OpOJ | OpOK | OpOL | OpOM | OpON | OpOO | OpOP | OpOQ | OpOR | OpOS | OpOT | OpOU | OpOV | OpOW | OpOX | OpOY | OpOZ | OpPA | OpPB | OpPC | OpPD | OpPE | OpPF | OpPG | OpPH | OpPI | OpPJ | OpPK | OpPL | OpPM | OpPN | OpPO | OpPP | OpPQ | OpPR | OpPS | OpPT | OpPU | OpPV | OpPW | OpPX | OpPY | OpPZ | OpQA | OpQB | OpQC | OpQD | OpQE | OpQF | OpQG | OpQH | OpQI | OpQJ | OpQK | OpQL | OpQM | OpQN | OpQO | OpQP | OpQQ | OpQR | OpQS | OpQT | OpQU | OpQV | OpQW | OpQX | OpQY | OpQZ | OpRA | OpRB | OpRC | OpRD | OpRE | OpRF | OpRG | OpRH | OpRI | OpRJ | OpRK | OpRL | OpRM | OpRN | OpRO | OpRP | OpRQ | OpRR | OpRS | OpRT | OpRU | OpRV | OpRW | OpRX | OpRY | OpRZ | OpSA | OpSB | OpSC | OpSD | OpSE | OpSF | OpSG | OpSH | OpSI</ |
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|        |              |           |                                              |                 |                                 |
|--------|--------------|-----------|----------------------------------------------|-----------------|---------------------------------|
| 003E02 | 41 7 0 C C14 |           | LA                                           | R7,SXPBCW       | XPTD STA TBL BCW                |
| 003E06 | 41 8 0 C C18 |           | LA                                           | R8,SXPTBL       | XPTD STA TBL STATUS             |
| 003E0A | 98 0 2 C 10C |           | LM                                           | R0,R2,SENSX1    | SECOND SENSE (GIVES 00 BACK)    |
| 003E0E | 45 3 0 C A72 |           | BAL                                          | R3,NSHSIO       | ISSUE SECOND SENSE IN A ROW     |
| 003E12 | 99 00 C E12  |           | HPR                                          |                 | • NO INTERRUPT FROM SENSE CMD   |
| 003E16 | 05 03 C 0F4  | C AFB ND4 | CLC                                          | SNSBUF(4),ALLOO | COMPARE DATA TO 00000000        |
| 003E1C | 47 8 0 C E80 |           | BC                                           | 8,NWRITE        | ALL OK = BRANCH (EQL)           |
| 003E20 | 99 00 C E20  |           | HPR                                          |                 | • SENSE DIDNT BRING IN 00/DATA  |
| 003E24 | 47 F 0 C E80 |           | BC                                           | 15,NWRITE       | BRANCH TO NEXT TEST             |
| 003E28 | 00000001     | DCONS1    | DC                                           | F'1'            | R0 = CMD (WRITE)                |
| 003E2C | 00020114     |           | DC                                           | X'00020114'     | R1 = SCW                        |
| 003E30 | 00000000     |           | DC                                           | F'0'            | R2 = BCW                        |
| 003E34 | 00000000     |           | DC                                           | F'0'            | R3 = FLAG/NSHSIO                |
| 003E38 | 00000000     |           | DC                                           | F'0'            | R4 = FLAG/NSHSIO                |
| 003E3C | 00000001     |           | DC                                           | F'1'            | R5 = XPTD CAW                   |
| 003E40 | 00820114     |           | DC                                           | X'00820114'     | R6 = XPTD SCW                   |
| 003E44 | 00003E9C     |           | DC                                           | A(TBCW01)       | R7 = XPTD STA TBL BCW ADRS      |
| 003E48 | 00003E78     |           | DC                                           | A(TBL002)       | R8 = XPTD STA TBL ADRS          |
| 003E4C | 00000002     | DCONS2    | DC                                           | F'2'            | R0 = CMD (READ)                 |
| 003E50 | 00000114     |           | DC                                           | X'00000114'     | R1 = SCW                        |
| 003E54 | 00000000     |           | DC                                           | F'0'            | R2 = BCW                        |
| 003E58 | 00000000     |           | DC                                           | F'0'            | R3 = I/O FLAG                   |
| 003E5C | 00000000     |           | DC                                           | F'0'            | R4 = I/O FLAG                   |
| 003E60 | 00000002     |           | DC                                           | F'2'            | R5 = XPT CAW                    |
| 003E64 | 00800114     |           | DC                                           | X'00800114'     | R6 = XPT SCW                    |
| 003E68 | 00003E9C     |           | DC                                           | A(TBCW01)       | R7 = XPT STA TBL BCW ADRS       |
| 003E6C | 00003E78     |           | DC                                           | A(TBL002)       | R8 = XPT STA TBL ADRS           |
| 003E70 | 00008000     | TBL001    | DC                                           | X'00008000'     | ATTENTION KEY                   |
| 003E74 | 00000000     |           | DC                                           | F'0'            | FULL WORD OF ZEROS (TABLE=FILL) |
| 003E78 | 00000C00     | TBL002    | DC                                           | X'00000C00'     | BUFFER COMPLETION               |
| 003E7C | 00000000     |           | DC                                           | F'0'            | FULL WORD OF ZEROS (TABLE=FILL) |
| 003E80 | 00000000     | TBL003    | DC                                           | X'00000000'     | BUFFER DONE/UNIT EXCEPTION      |
| 003E84 | 00000000     |           | DC                                           | F'0'            | FULL WORD OF ZEROS (TABLE=FILL) |
| 003E88 | 00000000     | TBL004    | DC                                           | X'00000000'     | UNIT EXCEPTION                  |
| 003E8C | 00000000     |           | DC                                           | F'0'            | FULL WORD OF ZEROS (TABLE=FILL) |
| 003E90 | 00001000     | TBL005    | DC                                           | X'00001000'     | BUSY                            |
| 003E94 | 00000000     |           | DC                                           | F'0'            | FULL WORD OF ZEROS (TABLE=FILL) |
| 003E98 | 00003531     | XBCWN     | DC                                           | A(ATNMSG+19)    | EXPECTED BCW: PRESS ATTENTION   |
| 003E9C | FFD0         | TBCW01    | DC                                           | X'FFD0'         | • EXPIRED STATUS TABLE BCW      |
| 003E9E | 30F0         |           | DC                                           | Y(TABLE+4)      |                                 |
| 003EA0 | 0010         | TBCW1     | DC                                           | X'0010'         | UNEXPIRED STATUS TABLE BCW      |
| 003EA2 | 30EC         |           | DC                                           | Y(TABLE)        |                                 |
|        |              | •         | STATUS AND STATUS TABLE COMPARISON CONSTANTS |                 |                                 |

|                                                              |                   |        |     |                  |                                 |
|--------------------------------------------------------------|-------------------|--------|-----|------------------|---------------------------------|
| 003EA4                                                       | 00000001          | NOUPK1 | DC  | F'1'             | WRITE PACKET : COMMAND          |
| 003EA8                                                       | 00020114          | NSCWUC | DC  | X'00020114'      | SCW FOR OUTPUT                  |
| 003EAC                                                       | 0170              |        | DC  | X'0170'          | BCW: BYTE COUNT                 |
| 003EAE                                                       | 351A              |        | DC  | Y(ATNMSG-4)      | BCW: DATA ADR                   |
| •                                                            |                   |        |     |                  |                                 |
| 003EB0                                                       | 58 6 0 C C20      | NWRITE | L   | R6,NXSCW2        | EXPECTED SCW                    |
| 003EB4                                                       | 41 7 0 C E9C      |        | LA  | R7,TBCW01        | EXPECTED TABLE BCW              |
| 003EB8                                                       | 41 8 0 C E78      |        | LA  | R8,TBL002        | EXPECTED TABLE STATUS           |
| 003EBC                                                       | 41 5 0 0 001      |        | LA  | R5,1(,0)         | EXPECTED CAW                    |
| 003EC0                                                       | 98 0 2 C 4A8      |        | LM  | R0,R2,OUTPK1     | GET I/O PACKET                  |
| 003EC4                                                       | 41 4 0 C EDO      |        | LA  | R4,NWCHK         | GET ADR / NEXT TEST             |
| 003EC8                                                       | 45 3 0 C A72      |        | BAL | R3,NSHSIO        | CALL NS-I/O SUBROUTINE          |
| 003ECC                                                       | 99 00 C ECC       |        | HPR |                  | • NO INTERRUPT OCCURRED         |
| 003ED0                                                       | 58 1 0 0 114      | NWCHK  | L   | R1,X'114'(,0)    | PICKUP BCW                      |
| 003ED4                                                       | 59 1 0 C 480      |        | C   | R1,XBCW0         | SHOULDN'T HAVE CHANGED          |
| 003ED8                                                       | 47 8 0 C EE4      |        | BC  | B,NOUT2          | BRANCH IF EQUAL AND ALL OK      |
| 003EDC                                                       | 99 00 1 000       |        | HPR | O(R1)            | • BCW CHANGED WITH T-FLAG SET   |
| 003EE0                                                       | 47 F 0 C EE4      |        | BC  | 15,NOUT2         | BRANCH TO NEXT TEST             |
| •                                                            |                   |        |     |                  |                                 |
| •                                                            |                   |        |     |                  |                                 |
| •                                                            |                   |        |     |                  |                                 |
| BEGIN CHECKING STATUS BITS : ATTENTION KEY TEST (NON-SHARED) |                   |        |     |                  |                                 |
| 003EE4                                                       | 41 8 0 C F0A      | NOUT2  | LA  | R11,NOU2X1       | ADDRESS OF CHECKING             |
| 003EE8                                                       | 41 5 0 0 001      |        | LA  | R5,1(,0)         | XPTD CAW                        |
| 003EEC                                                       | 58 6 0 C C20      |        | L   | R6,NXSCW2        | XPTD SCW                        |
| 003EF0                                                       | 41 7 0 C E9C      |        | LA  | R7,TBCW01        | XPTD STA TBL BCW                |
| 003EF4                                                       | 41 8 0 C E78      |        | LA  | R8,TBL002        | XPTD STA TBL STA                |
| 003EF8                                                       | 92 21 C 00D       |        | MVI | WC+1,X'21'       | WAIT COUNT= 00210000            |
| 003EFC                                                       | 17 4 4            |        | XR  | R4,R4            | CLEAR FLAG                      |
| 003EFE                                                       | 98 0 2 C EA4      |        | LM  | R0,R2,NOUPK1     | REQUEST ATTENTION KEY NOW       |
| 003F02                                                       | 45 3 0 C A72      |        | BAL | R3,NSHSIO        | CALL NS-I/O SUBROUTINE          |
| 003F06                                                       | 99 00 C F06       |        | HPR |                  | • NO INTERRUPT OCCURRED/WRITE   |
| 003F0A                                                       | 05 03 C E78 0 114 | NOU2X1 | CLC | XBCWN(4),276(0)  | COMPARE XPTD BCW TO ACTUAL      |
| 003F10                                                       | 47 8 0 C F18      |        | BC  | B,NATTN          | BRANCH IF BCW IS OK             |
| 003F14                                                       | 99 00 C F14       |        | HPR |                  | • BCW ERROR: UNEXPECTED VALUE   |
| 003F18                                                       | 41 1 0 C F40      | NATTN  | LA  | R1,NATNOK        | ADR OF INTERRUPT CHECK          |
| 003F1C                                                       | 40 1 0 0 0CE      |        | STH | R1,NMNP SW+6(,0) |                                 |
| 003F20                                                       | 02 03 C AE4 C AEC |        | MVC | STBCW2(4),STBCW  | SETUP STATUS TABLING            |
| 003F26                                                       | 02 07 C DEC C AF8 |        | MVC | TABLE(8),ALLOO   | SETUP STATUS TABLING            |
| 003F2C                                                       | 58 1 0 C 00C      |        | L   | R1,WC            | PICKUP WAIT COUNT • •           |
| 003F30                                                       | 91 80 C 0EE       | NATM   | TM  | TABLE+2,X'80'    | LOOK FOR ATTN KEY •             |
| 003F34                                                       | 47 1 0 C F40      |        | BC  | 1,NATNOK         | BRANCH IF ATTN KEY •            |
| 003F38                                                       | 46 1 0 C F30      |        | BCT | R1,NATM          | NOT ATTN...WAIT IN THIS LOOP •  |
| 003F3C                                                       | 99 00 C F3C       |        | HPR |                  | • NO ATTENTION KEY STATUS FOUND |
| 003F40                                                       | 91 80 C 0EE       | NATNOK | TM  | TABLE+2,X'80'    | LOOK FOR ATTENTION BIT IN STA   |

003F44 47 1 0 C F50  
 003F48 99 00 C F48  
 003F4C 47 F 0 C F50

003F50 98 0 8 C E4C  
 003F54 58 2 0 C 614  
 003F58 41 4 0 0 001  
 003F5C 50 4 0 C 00C  
 003F60 41 3 0 C F6C  
 003F64 45 4 0 C A72  
 003F68 99 00 C F68  
 003F6C 98 0 8 C E4C  
 003F70 58 2 0 C 614  
 003F74 41 3 0 C F80  
 003F78 45 4 0 C A72  
 003F7C 99 00 C F7C  
 003F80 47 4 0 C F88  
 003F84 99 00 C F84  
 003F88 91 FF C 0EE  
 003F8C 47 8 0 C F94  
 003F90 99 00 C F90  
 003F94 98 0 1 C 118  
 003F98 41 3 0 C FA8  
 003F9C 42 0 0 C 00E  
 003FA0 45 4 0 C A72  
 003FA4 99 00 C FA4  
 003FA8 47 4 0 0 08C  
 003FAC 99 00 C FAC  
 003FB0 47 F 0 0 08C  
 003FB4 99 00 B 000  
 003FB8 07 F B  
 003FBA 99 00 B 000  
 003FBE 07 F B

003FC0 0010  
 003FC2 3FD8  
 003FC4 0010  
 003FC6 3FD9

003FC8 00300114  
 003FCC 00320114  
 003FDO 00200114

BC 1,NBUSY  
 HPR  
 BC 15,NBUSY

\*  
 \* CHECK THE BUSY STATUS AND CC FOR NON-SHARED I/O TO CONSOLE  
 \*

NBUSY LM R0,R8,DCONS2  
 L R2,INPK1+8  
 LA R4,1(,0)  
 ST R4,WC  
 LA R3,NB1CHK  
 BAL R4,NSHS10

NB1CHK LM R0,R8,DCONS2  
 L R2,INPK1+8  
 LA R3,NB2CHK  
 BAL R4,NSHS10

NB2CHK BC 4,NB3CHK  
 HPR

NB3CHK TM TABLE+2,X'FF'  
 BC 8,NB4CHK  
 HPR

NB4CHK LM R0,R1,SHNOOP  
 LA R3,NB5CHK  
 STC R0,WC+2  
 BAL R4,NSHS10  
 HPR

NB5CHK BC 4,NDELET  
 HPR  
 BC 15,NDELET

NOHOLD HPR 0(R11)

NOSNS HPR 15,R11  
 BCR 0(R11)  
 BCR 15,R11  
 CNOP 0,4

BCW7FN DC X'0010'

BCW00N DC Y(DATA7F)  
 DC X'0010'  
 DC Y(DATA00)  
 CNOP 0,4

SF1P11 DC X'00300114'  
 SF1P10 DC X'00320114'  
 SF0P11 DC X'00200114'

BRANCH TO NEXT TEST IF OK  
 \* NO ATTENTION STATUS IN TABLE  
 BRANCH TO NEXT TEST IF OK

PICKUP GENERAL INPUT CONSTANTS  
 GET BCW

FIXUP WAIT COUNT  
 FIXUP WAIT COUNT

SEND A READ CMD OUT  
 \* GOT AN INTERRUPT; NOT EXPECTED  
 GET INPUT CONSTANTS AGAIN  
 BCW

SEND ANOTHER READ OUT  
 \* INTERRUPTED..SHOULDN'T HAVE.  
 BRANCH IF CC=1 (BUSY)  
 \* CC NOT 3 ; SHOULD BE 3 FOR BUSY  
 TABLE SHOULD BE CLEARED  
 BRANCH IF STATUS = OK  
 \* TABLE SHOULD = 00001000  
 GET NO-OP CMD

STRETCH WAIT COUNT  
 SEND NO-OP OUT TO CLEAN UP  
 \* GOT AN INTERRUPT FROM IMM=CMD  
 BRANCH IF CC=1 (ALL OK)  
 \* CC NOT 1 AFTER IMMEDIATE CMD  
 BRANCH TO NEXT TEST  
 \* NO INTERRUPT FROM HOLD CMD  
 RE-ENTER TEST AFTER ERROR  
 \* NO INTERRUPT FROM SENSE CMD  
 RE-ENTER TEST AFTER ERROR

BCW FOR F/E/P FLAG TEST  
 DATA = 7F  
 BCW FOR F/E/P FLAG TEST  
 DATA = 00

SCW FLAGS SET: F/P  
 SCW FLAGS SET: F/P/W  
 SCW FLAGS SET: P

|        |          |        |      |              |                                 |
|--------|----------|--------|------|--------------|---------------------------------|
| 003FD4 | 00220114 | SFOP10 | DC   | X'00220114'  | SCW FLAGS SET: P/W              |
| 003FD8 | 7F       | DATA7F | DC   | X'7F'        |                                 |
| 003FD9 | 00       | DATA00 | DC   | X'00'        |                                 |
| 003FDA | FF       | DATAFF | DC   | X'FF'        |                                 |
| 003FDB | 00       |        |      |              |                                 |
| 003FDC |          |        | CNOP | 0,4          |                                 |
| 003FDC | 00000E00 | NUCSTA | DC   | X'00000E00'  | NON-SHARED UNIT-CHECK STATUS    |
| 003FED | 00000000 |        | DC   | F'0'         | NON-SHARED UNIT-CHECK STATUS    |
| 003FE4 | 00B20114 | XP1F10 | DC   | X'00B20114'  | XPTD SCW P=F=1 (OUTPUT)         |
| 003FE8 | 00B00114 | XP1F11 | DC   | X'00B00114'  | XPTD SCW P=F=1 ( INPUT)         |
| 003FEC | 00A20114 | XP1F00 | DC   | X'00A20114'  | XPTD SCW P=1 (OUTPUT)           |
| 003FF0 | 00A00114 | XP1F01 | DC   | X'00A00114'  | XPTD SCW P=1 ( INPUT)           |
| 003FF4 | 0010     | BCWINN | DC   | X'0010'      | NON-SHARED INPUT BCW            |
| 003FF6 | 3124     |        | DC   | Y(ZERBX)     | NON-SHARED INPUT BCW            |
| 003FF8 | 0000000F | NCONX1 | DC   | F'15'        | R0                              |
| 003FFC | 00000000 |        | DC   | 4X'00000000' | R1 R2 R3 R4                     |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
| 00400C | 0000000F |        | DC   | F'15'        | R5                              |
| 004010 | 00000000 |        | DC   | 3F'0'        | R6 R7 R8                        |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
| 00401C | 00000004 | NCONX2 | DC   | F'4'         | R0                              |
| 004020 | 00000000 |        | DC   | 4F'0'        | R1 R2 R3 R4                     |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
| 004030 | 00000004 |        | DC   | F'4'         | R5                              |
| 004034 | 00000000 |        | DC   | 3F'0'        | R6 R7 R8                        |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
| 004040 | 00000000 | RTEMP  | DC   | 9F'0'        | NFLAGS: REGISTER STORAGE: R0=R8 |
|        | 00000000 |        |      |              | FOR HOLD                        |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
|        | 00000000 |        |      |              |                                 |
| 004064 | 00000000 | STEMP  | DC   | 9F'0'        | NFLAGS: REGISTER STORAGE: R0=R8 |
|        | 00000000 |        |      |              | FOR SNS                         |
|        | 00000000 |        |      |              |                                 |

|          |              |        |     |                                       |                                  |
|----------|--------------|--------|-----|---------------------------------------|----------------------------------|
| 00000000 |              |        |     |                                       |                                  |
| 00000000 |              |        |     |                                       |                                  |
| 00000000 |              |        |     |                                       |                                  |
| 00000000 |              |        |     |                                       |                                  |
| 00000000 |              |        |     |                                       |                                  |
| 00000000 |              |        |     |                                       |                                  |
| 00000000 |              |        |     |                                       |                                  |
| 004088   | 00040000     | WCNT2  | DC  | X'00040000'                           | DELAY COUNT FOR I/O COMPLETE     |
|          |              | •      |     |                                       |                                  |
|          |              | •      |     | CHECK PROPER OPERATION OF THE CONSOLE | DELETE KEY                       |
|          |              | •      |     |                                       |                                  |
| 00408C   | 41 1 0 0 009 | NDELET | LA  | R1,9(,0)                              |                                  |
| 004090   | 42 1 0 C 000 |        | STC | R1,WC+1                               | WAIT COUNT = 00090000            |
| 004094   | 98 0 8 C E28 |        | LM  | R0,R8,DCONS1                          | PICKUP OUTPUT CONSTANTS          |
| 004098   | 58 2 0 C 694 |        | L   | R2,DELPK1+8                           | GET BCW                          |
| 00409C   | 41 8 0 D 0A8 |        | LA  | R11,NDEL1                             |                                  |
| 0040A0   | 45 3 0 C A72 |        | BAL | R3,NSHS10                             | REQUEST DELETE KEY NOW           |
| 0040A4   | 99 00 D 0A4  |        | HPR |                                       | • NO INTERRUPT OCCURRED/WRITE    |
| 0040A8   | 41 4 0 D 0B8 | NDEL1  | LA  | R4,NDEL2                              |                                  |
| 0040AC   | 98 0 2 C 6B0 |        | LM  | R0,R2,INPK2                           | GET AN INPUT COMMAND/STUFF       |
| 0040B0   | 45 3 0 C A72 |        | BAL | R3,NSHS10                             | SEND READ OUT FOR DELETE         |
| 0040B4   | 99 00 D 0B4  |        | HPR |                                       | • NO INTERRUPT / DELETE KEY      |
| 0040B8   | 95 0D C 0EE  | NDEL2  | CLI | TABLE+2,X'0D'                         | CHECK STATUS FOR DELETE          |
| 0040BC   | 47 8 0 D 0C4 |        | BC  | 8,NDEL3                               | BRANCH IF STATUS = 0D (OK)       |
| 0040C0   | 99 00 D 0C0  |        | HPR |                                       | • DIDNT GET EXPECTED STATUS      |
| 0040C4   | 47 F 0 D 0C8 | NDEL3  | BC  | 15,NEOM                               | BRANCH TO NEXT TEST              |
|          |              | •      |     |                                       |                                  |
|          |              | •      |     | CHECK E=O-M KEY                       | ON CONSOLE                       |
|          |              | •      |     |                                       |                                  |
| 0040C8   | 98 0 8 C E28 | NEOM   | LM  | R0,R8,DCONS1                          | GET OUTPUT CONSTANTS             |
| 0040CC   | 58 2 0 C 6A0 |        | L   | R2,EOMPK1+8                           | GET BCW FOR E=O-M REQUEST        |
| 0040D0   | 17 4 4       |        | XR  | R4,R4                                 |                                  |
| 0040D2   | 41 8 0 D 0DE |        | LA  | R11,NEOM1                             |                                  |
| 0040D6   | 45 3 0 C A72 |        | BAL | R3,NSHS10                             | REQUEST OPERATOR/E=O-M KEY       |
| 0040DA   | 99 00 D 0DA  |        | HPR |                                       | • NO INTERRUPT FROM WRITE CMD    |
| 0040DE   | 98 0 8 C E4C | NEOM1  | LM  | R0,R8,DCONS2                          | GET INPUT CONSTANTS              |
| 0040E2   | 18 6 1       |        | LR  | R6,R1                                 | PICKUP EXPECTED SCW              |
| 0040E4   | 58 2 0 C 6B8 |        | L   | R2,INPK2+8                            | GET INPUT BCW                    |
| 0040E8   | 41 8 0 D 0F4 |        | LA  | R11,NEOM2                             |                                  |
| 0040EC   | 45 3 0 C A72 |        | BAL | R3,NSHS10                             | SEND READ / E=O-M KEY            |
| 0040F0   | 99 00 D 0FD  |        | HPR |                                       | • NO INTERRUPT FROM E=O-M KEY    |
| 0040F4   | 95 37 C 124  | NEOM2  | CLI | ZERBX,X'37'                           | CHECK FOR PROPER E=O-M CODE      |
| 0040F8   | 47 8 0 D 104 |        | BC  | 8,NFLAGS                              | BRANCH IF IN BUFFER OK           |
| 0040FC   | 99 00 D 0FC  |        | HPR |                                       | • E=O-M CODE NOT IN INPUT BUFFER |
| 004100   | 47 F 0 D 104 |        | BC  | 15,NFLAGS                             | BRANCH TO NEXT TEST              |



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•  
CHECK THE FOLLOWING SCW FLAGS: E/P/F (PARITY GENERATION)

|        |              |        |     |              |                             |                    |    |
|--------|--------------|--------|-----|--------------|-----------------------------|--------------------|----|
| 004104 | 98 0 8 C FF8 | NFLAGS | LM  | R0,R8,NCONX1 | PICKUP                      | HOLD CMD/CONSTANTS | 0  |
| 004108 | 58 1 0 C FCC |        | L   | R1,SFIP10    |                             | SCW                | 0  |
| 00410C | 58 2 0 C FCD |        | L   | R2,BCW7FN    |                             | BCW (DATA=7F)      | 0  |
| 004110 | 41 3 0 C FB4 |        | LA  | R3,NOHOLD    |                             | NO--INT--ADDRESS   | 0  |
| 004114 | 58 6 0 C FE4 |        | L   | R6,XPIF10    |                             | XPT SCW            | 0  |
| 004118 | 41 7 0 C C14 |        | LA  | R7,SXPBCW    |                             | XPT STA TBL BCW    | 0  |
| 00411C | 41 8 0 C C18 |        | LA  | R8,SXPTBL    |                             | XPT STA TBL        | 0  |
| 004120 | 90 0 8 D 040 |        | STM | R0,R8,RTEMP  | SAVE ALL CONSTANTS/NXT HOLD |                    | 0  |
| 004124 | 45 8 0 C A72 |        | BAL | R11,NSHSIO   | SEND A HOLD (P,F FLAGS SET) |                    | 0  |
| 004128 | 98 0 8 D 01C |        | LM  | R0,R8,NCONX2 | PICKUP SENSE CMD/CONSTANTS  |                    | •I |
| 00412C | 58 1 0 C FC8 |        | L   | R1,SFIP11    |                             | SCW                | •I |
| 004130 | 58 2 0 C FF4 |        | L   | R2,BCWINN    |                             | BCW (XPT: 7F DATA) | •I |
| 004134 | 41 3 0 C FBA |        | LA  | R3,NOSNS     |                             | NO--INT--ADDRESS   | •I |
| 004138 | 58 6 0 C FE8 |        | L   | R6,XPIF11    |                             | XPT SCW            | •I |
| 00413C | 41 7 0 C C14 |        | LA  | R7,SXPBCW    |                             | XPT STA TBL BCW    | •I |
| 004140 | 41 8 0 C C18 |        | LA  | R8,SXPTBL    |                             | XPT STA TBL        | •I |
| 004144 | 90 0 8 D 064 |        | STM | R0,R8,STEMP  | SAVE ALL CONSTANTS FOR SNS  |                    | •I |
| 004148 | 45 8 0 C A72 |        | BAL | R11,NSHSIO   | SEND SENSE OUT (P=F=1)      |                    | •I |
| 00414C | 98 0 8 D 040 |        | LM  | R0,R8,RTEMP  | PICKUP HOLD=CONSTANTS       |                    | 0  |
| 004150 | 58 1 0 C FD4 |        | L   | R1,SFOP10    |                             | SCW WITH P=1/F=0   | 0  |
| 004154 | 58 6 0 C FEC |        | L   | R6,XPIF00    |                             | XPT SCW: P=1/F=0   | 0  |
| 004158 | 45 8 0 C A72 |        | BAL | R11,NSHSIO   | SEND THE HOLD COMMAND       |                    | 0  |
| 00415C | 98 0 8 D 064 |        | LM  | R0,R8,STEMP  | PICKUP SENSE CONSTANTS      |                    | •I |
| 004160 | 58 1 0 C F00 |        | L   | R1,SFOP11    |                             | SCW WITH P=1/F=0   | •I |
| 004164 | 58 6 0 C FF0 |        | L   | R6,XPIF01    |                             | XPT SCW: P=1/F=0   | •I |
| 004168 | 45 8 0 C A72 |        | BAL | R11,NSHSIO   | SEND THE SENSE COMMAND      |                    | •I |
| 00416C | 98 0 8 D 040 |        | LM  | R0,R8,RTEMP  |                             |                    | 0  |
| 004170 | 58 2 0 C FC4 |        | L   | R2,BCWOON    | HOLD: DATA IS 00 P=F=1      |                    | 0  |
| 004174 | 45 8 0 C A72 |        | BAL | R11,NSHSIO   |                             |                    | 0  |
| 004178 | 98 0 8 D 064 |        | LM  | R0,R8,STEMP  | SENSE DATA IS 00 P=F=1      |                    | •I |
| 00417C | 45 8 0 C A72 |        | BAL | R11,NSHSIO   |                             |                    | •I |
| 004180 | 98 0 8 D 040 |        | LM  | R0,R8,RTEMP  |                             |                    | 0  |
| 004184 | 58 2 0 C FC4 |        | L   | R2,BCWOON    | HOLD: DATA IS 00 F=0 P=1    |                    | 0  |
| 004188 | 58 1 0 C FD4 |        | L   | R1,SFOP10    |                             |                    | 0  |
| 00418C | 58 6 0 C FEC |        | L   | R6,XPIF00    |                             |                    | 0  |
| 004190 | 45 8 0 C A72 |        | BAL | R11,NSHSIO   |                             |                    | 0  |
| 004194 | 98 0 8 D 064 |        | LM  | R0,R8,STEMP  | SENSE DATA IS 00 F=0 P=1    |                    | •I |
| 004198 | 58 1 0 C F00 |        | L   | R1,SFOP11    |                             |                    | •I |
| 00419C | 58 6 0 C FF0 |        | L   | R6,XPIF01    |                             |                    | •I |
| 0041A0 | 45 8 0 C A72 |        | BAL | R11,NSHSIO   |                             |                    | •I |

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•  
EFLAG

# BEGIN CHECKING VALID ERROR CONDITIONS: THE E-FLAG (SCW)

|        |              |     |             |                                   |    |
|--------|--------------|-----|-------------|-----------------------------------|----|
| 0041A4 | 98 0 8 D 040 | LM  | R0,R8,RTEMP | HOLD: P=1 F=1 DATA=7F             | 0  |
| 0041A8 | 45 8 0 C A72 | BAL | R11,NSHSIO  |                                   | 0  |
| 0041AC | 98 0 8 D 064 | LM  | R0,R8,STEMP |                                   | 01 |
| 0041B0 | 58 1 0 C FDD | L   | R1,SFOPII   |                                   | 01 |
| 0041B4 | 58 6 0 C D78 | L   | R6,XESCW2   | SCW: XPT T/E/P FLAGS SET          | 01 |
| 0041B8 | 90 0 8 D 064 | STM | R0,R8,STEMP |                                   | 01 |
| 0041BC | 45 8 0 C A72 | BAL | R11,NSHSIO  |                                   | 01 |
| 0041C0 | 95 FF C 124  | CLI | ZERBX,X'FF' | BIT 0 OF BYTE SET ?               |    |
| 0041C4 | 47 8 0 D 1CC | BC  | 8,0+8       | BRANCH = OK                       |    |
| 0041C8 | 99 00 D 1C8  | HPR |             | * DATA DIDINT GET BIT 0 SET/ERROR |    |
| 0041CC | 98 0 8 D 040 | LM  | R0,R8,RTEMP |                                   | 0  |
| 0041D0 | 58 1 0 C FD4 | L   | R1,SFOPI0   | HOLD COMMAND P=0 F=1 DATA=7F      | 0  |
| 0041D4 | 58 6 0 C FEC | L   | R6,XPIFOO   |                                   | 0  |
| 0041D8 | 45 8 0 C A72 | BAL | R11,NSHSIO  |                                   | 0  |
| 0041DC | 98 0 8 D 064 | LM  | R0,R8,STEMP | SENSE CMD : P=1 F=1               | 01 |
| 0041E0 | 58 1 0 C FC8 | L   | R1,SFIPII   |                                   | 01 |
| 0041E4 | 58 6 0 C D74 | L   | R6,XESCW1   | SCW: XPT T/E/P/F FLAGS SET        | 01 |
| 0041E8 | 45 8 0 C A72 | BAL | R11,NSHSIO  | DATA GOES TO ...FF                | 01 |
| 0041EC | 95 FF C 124  | CLI | ZERBX,X'FF' |                                   | 01 |
| 0041F0 | 47 8 0 D 1F8 | BC  | 8,0+8       |                                   | 01 |
| 0041F4 | 99 00 D 1F4  | HPR |             | * BIT 0 NOT SET DURING ERROR      | 01 |
| 0041F8 | 98 0 8 D 040 | LM  | R0,R8,RTEMP |                                   | 0  |
| 0041FC | 58 2 0 C FC4 | L   | R2,BCWOON   | HOLD COMMAND: P=F=1 DATA =00      | 0  |
| 004200 | 45 8 0 C A72 | BAL | R11,NSHSIO  |                                   | 0  |
| 004204 | 98 0 8 D 064 | LM  | R0,R8,STEMP |                                   | 01 |
| 004208 | 45 8 0 C A72 | BAL | R11,NSHSIO  | SENSE CMD: P=0 F=1                | 01 |
| 00420C | 95 80 C 124  | CLI | ZERBX,X'80' | DATA: 80                          | 01 |
| 004210 | 47 8 0 D 218 | BC  | 8,0+8       |                                   | 01 |
| 004214 | 99 00 D 214  | HPR |             | * BIT ZERO OF BYTE NOT SET        | 01 |
| 004218 | 98 0 8 D 040 | LM  | R0,R8,RTEMP |                                   | 0  |
| 00421C | 58 1 0 C FD4 | L   | R1,SFOPI0   |                                   | 0  |
| 004220 | 58 6 0 C FEC | L   | R6,XPIFOO   | HOLD COMMAND P=1 F=0 DATA=000     | 0  |
| 004224 | 58 2 0 C FC4 | L   | R2,BCWOON   |                                   | 0  |
| 004228 | 45 8 0 C A72 | BAL | R11,NSHSIO  |                                   | 0  |
| 00422C | 98 0 8 D 064 | LM  | R0,R8,STEMP |                                   | 01 |
| 004230 | 58 1 0 C FC8 | L   | R1,SFIPII   | SENSE CMD P=1 F=1 DATA=001        | 01 |
| 004234 | 58 6 0 C D74 | L   | R6,XESCW1   | SCW: XPT T/E/P/F FLAGS SET        | 01 |
| 004238 | 45 8 0 C A72 | BAL | R11,NSHSIO  |                                   | 01 |
| 00423C | 95 80 C 124  | CLI | ZERBX,X'80' |                                   |    |
| 004240 | 47 8 0 D 248 | BC  | 8,0+8       |                                   |    |
| 004244 | 99 00 D 244  | HPR |             | * BIT 0 OF BYTE NOT SET (ERROR)   |    |

```

004248 98 0 2 C CDC
00424C 45 4 0 C A72
004250 58 1 0 D 088
004254 46 1 0 D 254
004258 98 1 4 C D30
00425C 59 1 0 C CE4
004260 47 8 0 D 268
004264 99 00 D 264
004268 59 2 0 C CE8
00426C 47 8 0 D 274
004270 99 00 D 270
004274 59 3 0 C CF0
004278 47 8 0 D 280
00427C 99 00 D 27C
004280 59 4 0 C CF4
004284 47 8 0 D 28C
004288 99 00 D 288
00428C 95 86 D 201
004290 47 8 0 D 298
004294 99 00 D 294
004298 41 0 0 D 008
00429C 9C 00 D 080
0042A0 47 8 0 D 2A0
0042A4 95 0C D 000
0042A8 47 8 0 D 280
0042AC 99 00 D 2AC

```

```

*
* CHECK THE SCW D-FLAG AND ALL BCW OP-CODES IN ONE BIG TRY
*

```

```

BCWOPX LM R0,R2,FIN PICKUP CAW/SCW/BCW
BAL R4,NSHS10 CALL I/O ROUTINE (TO CONSOLE)
L R1,WCNT2 GET DELAY COUNT (I/O GOING)
BCT R1,* DELAY UNTIL ALL I/O DONE
LM R1,R4,BCWNOX PICKUP EXPECTED BCWS
C R1,FINBCW WAS FIRST BCW OK?
BC 8,*+8 (BCW #1 USED CHAIN CODE)
HPR • BCW WAS WRONG ...BAD CHAIN ?
C R2,FINBCW+4 (BCW #2 USED LINK CODE)
BC 8,*+8 BRANCH IF BCW 2 IS OK
HPR • 2ND BCW WAS WRONG...BAD LINK ?
C R3,LINKSL (BCW #3 CHAINED ALSO)
BC 8,*+8 BRANCH IF BCW 3 IS OK
HPR • 3RD BCW WAS WRONG... BAD CHAIN?
C R4,BCWEND (BCW #4 USED STOP=IMM CODE)
BC 8,*+8 BRANCH IF BCW 4 IS OK
HPR • BCW 4 WAS WRONG...BAD STOP=CD
CLI 513(0),X'86' CHECK SCW FOR T/D/W FLAGS ON
BC 8,*+8 BRANCH IF ALL 3 ARE ON
HPR • SCW DIDNT CONTAIN T/D/W FLAGS
LA R0,11(,0) SET SHARED ADDRESS FOR CONSOLE
S10 X'80'(0) WAIT FOR STATUS STORED
BC 11,* STATUS SHOULD BE CHAN/DEV END
CLI 0(0),X'0C' BRANCH IF OK
BC 8,XXIT • BAD STATUS ON SEL=SHARED ADR
HPR

```

```

*
* THE 9400 MPX TEST ENDS HERE...CLEANUP OPERATIONS FOLLOW
*

```

```

0042B0 07000700
0042B4 98 0 2 C 040
0042B8 45 4 0 C 02C
0042BC 47 8 0 D 400
0042C0 00005000
 004400

```

```

XAIT DC X'07000700' EXIT FROM MPX-DMR
LM R0,R2,TIMERS PICKUP TIMER-ENABLE PACKET
BAL R4,S10MSH CALL MPX-SH I/O SUBROUTINE
BC 15,STORT JUMP TO STORAGE DMR
DC X'00005000' STORAGE DMR BASE REG CONSTANT
ORG 50MR+13312 BEGIN STORAGE AT 4400HEX
DROP 12
USING 50MR+16384,14

```

```

004400 58 E 0 D 2CD
004404 47 F 0 D 408
004408 92 00 E 1AD
00440C 92 00 E 17D
004410 92 55 E 183
004414 92 00 E 1AF
004418 92 55 E 1B1
00441C 47 F 0 D 470

```

```

004420 58 1 0 E 188
004424 58 2 0 E 184
004428 45 F 0 D 518
00442C 98 0 E E 18C
004430 47 F 0 D 434

```

```

004434 47 F 0 D 438
004438 58 6 0 E UC4
00443C 58 1 0 E 180
004440 58 3 0 E 19C
004444 58 4 0 E 19C
004448 58 5 0 E 18C
00444C 04 6 0
00444E 0700
004450 5A 4 3 D 400
004454 5A 3 0 E 000
004458 19 1 3
00445A 47 2 0 D 450
00445E 19 4 5
004460 47 8 0 D 46C
004464 99 00 D 464
004468 47 F 0 D 470
00446C 47 F 0 D 470

```

```

004470 47 F 0 D 474
004474 58 3 0 D FAD
004478 45 F 0 D 57C
00447C 95 55 E 1B7
004480 47 6 0 D 494
004484 58 3 0 D FB4
004488 45 F 0 D 57C
00448C 95 55 E 1B7
004490 47 8 0 D 5C2

```

```

004494 58 3 0 D FA4
004498 45 F 0 D 57C
00449C 95 55 E 1B7

```

```

* * * * * EJECT * * * * *
* * * * * THE 9400 STORAGE DRR BEGINS HERE * * * * *
* *
START L 14,BASEC LOAD BASE REG FOR 5000 HEX
BC 15,++4
MVI CODEX+1,X'00' CLR PRINT BYPASS CODE
MVI BCTR+1,X'00' CLR ADDRESS JUMP CTR
MVI BABY+1,X'55' SET STK 1 CODE
MVI ACTR+1,X'00' CLR ADDRESS JUMP CTR
MVI UNIT+1,X'55' SET UNIT 1 CODE
BC 15,TEST
* MOVE PROGRAM FROM 4400 TO 1400 HEX
MOVE L 1,BASE2
L 2,BASE1
BAL 15,MVRIN
LM 13,14,BASE3 LOAD NEW BASE REGISTERS
BC 15,1076(U,13) START AT 1434 HEX
* * * * * SUMCHECK TEST * * * * *
* *
SUB BC 15,++4
L 6,PSWM LOAD PSW CODE
L 1,TOTADR ADDRESSES TO BE SUMED
L 3,ZERGES CLEAR REG 3
L 4,ZERGES CLEAR REG 4
L 5,SUMCK SUMCHECK CONSTANT
SPM 6
CNOF 0,4
HOP A 4,1024(3,13) ADD TO R4 ,START AT 1400 HEX
A 3,DADRA AND INCREMENT BY FULLWORD
CR 1,3 ALL ADDRESSES ADDED ?
BC 2,HOP NO, THEN JUMP
CR 4,5 CHECK SUM
BC 8,POP EQUAL,THEN JUMP
HPR * DISPLAY ERROR, SUMCHECK
BC 15,++8
POP BC 15,TEST
* *
* THE FOLLOWING TESTS ARE TO DETERMINE SIZE OF MEMORY *
* *
* TEST FOR 24K
TEST BC 15,++4
L 3,TADR1
BAL 15,SUB9
CLI RECRD+1,X'55'
HC 6,++20
L 3,TADR1A
BAL 15,SUB9
CLI RECRD+1,X'55'
BC 8,T24K
* TEST FOR 32K
L 3,TADR2
BAL 15,SUB9
CLI RECRD+1,X'55'

```

|        |    |    |   |   |     |
|--------|----|----|---|---|-----|
| 0044A0 | 47 | 6  | 0 | 0 | 484 |
| 0044A4 | 58 | 3  | 0 | 0 | F88 |
| 0044A8 | 45 | F  | 0 | 0 | 57C |
| 0044AC | 95 | 55 | E |   | 187 |
| 0044B0 | 47 | 8  | 0 | 0 | 60A |

|        |    |   |   |   |       |
|--------|----|---|---|---|-------|
| 0044B4 | 58 | 3 | 0 | 0 | F A 8 |
| 0044B8 | 45 | F | 0 | 0 | 5 7 C |
| 0044BC | 95 | 5 | 5 | E | 1 B 7 |
| 0044C0 | 47 | 6 | 0 | 0 | 4 D 4 |
| 0044C4 | 58 | 3 | 0 | 0 | F B C |
| 0044C8 | 45 | F | 0 | 0 | 5 7 C |
| 0044CC | 95 | 5 | 5 | E | 1 B 7 |
| 0044D0 | 47 | 8 | 0 | 0 | 6 5 2 |

|        |    |    |   |     |     |
|--------|----|----|---|-----|-----|
| 0044D4 | 58 | 3  | 0 | 0   | FAC |
| 0044D8 | 45 | F  | 0 | 0   | 57C |
| 0044DC | 95 | 55 | E | 1B7 |     |
| 0044E0 | 47 | 6  | 0 | 0   | 4F4 |
| 0044E4 | 58 | 3  | 0 | 0   | FC0 |
| 0044E8 | 45 | F  | 0 | 0   | 57C |
| 0044EC | 95 | 55 | E | 1B7 |     |
| 0044F0 | 47 | 8  | 0 | 0   | 6D6 |

|        |    |    |   |     |     |
|--------|----|----|---|-----|-----|
| 0044F4 | 58 | 3  | 0 | 0   | F80 |
| 0044F8 | 45 | F  | 0 | 0   | 57C |
| 0044FC | 95 | 55 | E | 1B7 |     |
| 004500 | 47 | 6  | 0 | 0   | 514 |
| 004504 | 58 | 3  | 0 | 0   | FC4 |
| 004508 | 45 | F  | 0 | 0   | 57C |
| 00450C | 95 | 55 | E | 1B7 |     |
| 004510 | 47 | 8  | 0 | 0   | 766 |
| 004514 | 47 | F  | 0 | 0   | 7DE |

|        |    |    |   |     |   |     |
|--------|----|----|---|-----|---|-----|
| 004518 | D2 | FF | 1 | 000 | 2 | 000 |
| 00451E | D2 | FF | 1 | 100 | 2 | 100 |
| 004524 | D2 | FF | 1 | 200 | 2 | 200 |
| 00452A | D2 | FF | 1 | 300 | 2 | 300 |
| 004530 | D2 | FF | 1 | 400 | 2 | 400 |
| 004536 | D2 | FF | 1 | 500 | 2 | 500 |
| 00453C | D2 | FF | 1 | 600 | 2 | 600 |
| 004542 | D2 | FF | 1 | 700 | 2 | 700 |
| 004548 | D2 | FF | 1 | 800 | 2 | 800 |
| 00454E | D2 | FF | 1 | 900 | 2 | 900 |
| 004554 | D2 | FF | 1 | A00 | 2 | A00 |
| 00455A | D2 | FF | 1 | B00 | 2 | B00 |
| 004560 | D2 | FF | 1 | C00 | 2 | C00 |
| 004566 | D2 | FF | 1 | D00 | 2 | D00 |
| 00456C | D2 | FF | 1 | E00 | 2 | E00 |
| 004572 | D2 | FF | 1 | F00 | 2 | F00 |
| 004578 | 4F | 0  | F | 000 |   |     |

```

 RC
 L
 BAL
 CLI
 HC
* TEST FUR 40K
 L
 BAL
 CLI
 HC
 L
 BAL
 CLI
 HC
* TEST FUR 65K
 L
 BAL
 CLI
 BC
 L
 BAL
 CLI
 HC
* TEST FUR 90K
 L
 BAL
 CLI
 BC
 L
 BAL
 CLI
 BC
 BC

```

```
* * * * *
```

THE FOLLOWING IS A MOVE PROGRAM ROUTINE

```

MVRTN MVC 0(256,1),0(2)
 MVC 256(256,1),256(2)
 MVC 512(256,1),512(2)
 MVC 768(256,1),768(2)
 MVC 1024(256,1),1024(2)
 MVC 1280(256,1),1280(2)
 MVC 1536(256,1),1536(2)
 MVC 1792(256,1),1792(2)
 MVC 2048(256,1),2048(2)
 MVC 2304(256,1),2304(2)
 MVC 2560(256,1),2560(2)
 MVC 2816(256,1),2816(2)
 MVC 3072(256,1),3072(2)
 MVC 3328(256,1),3328(2)
 MVC 3584(256,1),3584(2)
 MVC 3840(256,1),3840(2)
 RC 15,0(0,15)

```

```

* * * * *
*
* THE FOLLOWING IS A ROUTINE TO DETERMINE SIZE OF MEMORY

```

|        |    |    |   |       |
|--------|----|----|---|-------|
| 0045A6 | 80 | 00 | E | 004   |
| 0045AA | 98 | 0  | 2 | E 008 |
| 0045AE | 90 | 2  | 3 | 008   |
| 0045B2 | 50 | 1  | 0 | 0 100 |
| 0045B6 | 50 | 4  | 0 | 0 114 |
| 0045BA | 9C | 00 | 0 | 0 080 |
| 0045BE | 47 | F  | 0 | 0 5BE |

|        |    |    |   |     |     |
|--------|----|----|---|-----|-----|
| 0045C2 | 47 | F  | 0 | D   | 5C6 |
| 0045C6 | 93 | 01 | E | 1AD |     |
| 0045CA | 95 | 02 | E | 1AD |     |
| 0045CE | 47 | 8  | 0 | D   | 5E2 |
| 0045D2 | 58 | 3  | 0 | E   | 0E4 |
| 0045D6 | 58 | 4  | 0 | E   | 0E8 |
| 0045DA | 47 | F  | 0 | D   | 5A6 |
| 0045DE | 47 | F  | 0 | D   | 420 |
| 0045E2 | 47 | F  | 0 | D   | 5E6 |

|        |    |   |   |   |     |
|--------|----|---|---|---|-----|
| 0045E6 | 48 | 8 | 0 | E | 1A8 |
| 0045EA | 58 | 9 | 0 | D | F20 |
| 0045EE | 58 | 2 | 0 | D | F5C |
| 0045F2 | 45 | F | 0 | D | E42 |
| 0045F6 | 48 | 8 | 0 | E | 1AA |
| 0045FA | 58 | 9 | 0 | D | F30 |
| 0045FE | 58 | 2 | 0 | D | F88 |
| 004602 | 45 | F | 0 | D | E42 |
| 004606 | 47 | F | 0 | D | 214 |

|        |    |    |   |   |     |
|--------|----|----|---|---|-----|
| 00460A | 47 | F  | 0 | D | 6UE |
| 00460E | 93 | 01 |   | E | 1AC |
| 004612 | 95 | 02 |   | E | 1AD |
| 004616 | 47 | 8  | 0 | D | 62A |
| 00461A | 58 | 3  | 0 | E | UFC |

```

Sub9 MVI RECRD+1,X'00'
 L 2,ZEROES
 L 1,ONS
 L 2,U(0,3)
 XR 1,2
 ST 1,U(0,3)
 C 2,U(0,3)
 BC 8,WIN
 BC 15,U(0,15)
WIN MVI RECRD+1,X'55'
 BC 15,U(0,15)
* * * * *
* * * * *
PRINT SSM MASK
 LM 0,2,CAN
 STM 2,3,184(0)
 ST 1,256(0,0)
 SI 4,276(0,0)
 SIO 128(0)
 BC 15,*
 SET SYSTEM MASK
 LOAD CAN AND SCW
 STORE NEW PSW
 STORE SCW
 STORE BCW
 START PRINT OUT

```

```

*
*
*

* THE FOLLOWING ARE INITIAL LOADING AND SEQUENCE OF ROUTINES
* INSTRUCTIONS FOR TESTING 24K MEMORY

* 24K MEMORY TEST
T24K BC 15,++4
 AI CODEX,X'D1' ADD TO PRINT BYPASS CODE
 CLI CODEX+1,X'02' PRINT BYPASS?
 BC 8,T24K2
 L 3,MNPSW1 NEW PSW FOR 24K TEST
 L 4,MBCW1 BCW FOR 24K TEST
 BC 15,PRINT
T24K1 BC 15,MOVE
T24K2 BC 15,++4
*
* X DIM TEST
 LH 8,CODEA0
 L 9,FADK2
 L 2,LADK6
 BAL 15,SUB1
 LH 8,CODEA1
 L 9,FADK2A
 L 2,LADK6A
 BAL 15,SUB1
 BC 15,532(U,U) RETURN TO 214 HEX, PRELUDE

```

```

* THE FOLLOWING ARE INITIAL LOADING AND SEQUENCE OF ROUTINES *
* INSTRUCTIONS FOR TESTING 32K MEMORY *

* 32K MEMORY TEST'
T32K BC 15,0+4
 AI CODEX,X'01' ADD TO PRINT BYPASS CODE
 CLI CODEX+1,X'02' PRINT BYPASS?
 BC 0,T32K2
 L 3,MNPSW2 NEW PSW FOR 32K TEST

```

|        |    |   |   |   |     |
|--------|----|---|---|---|-----|
| 00462E | 48 | 8 | 0 | E | 1A8 |
| 004632 | 58 | 9 | 0 | D | F20 |
| 004636 | 58 | 2 | 0 | D | F60 |
| 00463A | 45 | F | 0 | D | E42 |
| 00463E | 48 | 8 | 0 | E | 1AA |
| 004642 | 58 | 9 | 0 | D | F30 |
| 004646 | 58 | 2 | 0 | D | F8C |
| 00464A | 45 | F | 0 | D | E42 |
| 00464E | 47 | F | 0 | D | 214 |

|        |    |    |   |     |     |
|--------|----|----|---|-----|-----|
| 004652 | 47 | F  | 0 | 0   | 656 |
| 004656 | 93 | 01 | E | 1AC |     |
| 00465A | 95 | 02 | E | 1AD |     |
| 00465E | 47 | 8  | 0 | 0   | 672 |
| 004662 | 58 | 3  | 0 | E   | 114 |
| 004666 | 54 | 4  | 0 | E   | 118 |
| 00466A | 47 | F  | 0 | 0   | 5A6 |
| 00466E | 47 | F  | 0 | 0   | 420 |
| 004672 | 47 | F  | 0 | 0   | 676 |

|        |    |   |   |   |     |
|--------|----|---|---|---|-----|
| 004676 | 48 | 8 | 0 | E | 1A8 |
| 00467A | 58 | 9 | 0 | 0 | F20 |
| 00467E | 58 | 2 | 0 | 0 | F60 |
| 004682 | 45 | F | 0 | 0 | E42 |
| 004686 | 48 | 6 | 0 | E | 1AA |
| 00468A | 58 | 9 | 0 | 0 | F30 |
| 00468E | 58 | 2 | 0 | 0 | F8C |
| 004692 | 45 | F | 0 | 0 | E42 |

|        |    |    |   |     |
|--------|----|----|---|-----|
| 004696 | 92 | 33 | E | 183 |
| 00469A | 45 | C  | D | 84E |

|        |    |    |   |   |     |
|--------|----|----|---|---|-----|
| 00469E | 48 | S  | O | E | 1A4 |
| 0046A2 | 45 | C  | O | D | 90E |
| 0046A6 | 48 | S  | O | E | 1A6 |
| 0046AA | 92 | UO |   | E | 1B5 |
| 0046AE | 45 | C  | O | D | 90E |

|        |    |   |   |   |     |
|--------|----|---|---|---|-----|
| 0046B2 | 48 | 8 | 0 | E | 1A8 |
| 0046B6 | 58 | 9 | 0 | D | F24 |
| 0046BA | 58 | 2 | 0 | D | F64 |
| 0046BE | 45 | F | 0 | D | E42 |
| 0046C2 | 48 | 8 | 0 | E | 1AA |
| 0046C6 | 58 | 9 | 0 | D | F34 |
| 0046CA | 58 | 2 | 0 | D | F90 |
| 0046CE | 45 | F | 0 | D | E42 |
| 0046D2 | 47 | F | 0 | D | 214 |

```

L 4,NBCWZ
BC 15,PRINT
T32K1 BC 15,MOVE
T32K2 BC 15,++4
* A DTH TEST
LH 8,CODEAU
L 9,FADR2
L 2,LADR7
BAL 15,SUB1
LH 8,CODEA1
L 9,FADR2A
L 2,LADR7A
BAL 15,SUB1
BC 15,532(0,0)

```

BC FOR 32K TEST

RETURN TO 214 HEX, PRELUDE

```

* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
* THE FOLLOWING ARE INITIAL LOADING AND SEQUENCE OF ROUTINES
* INSTRUCTIONS FOR TESTING 48K MEMORY
* * * * *
* * * * *
* 48K MEMORY TEST

```

```

T48K BC 15,#+4
 AI CODEX,X'01'
 CLI CODEX+1,X'02'
 BC 8,T48K2
 L 3,MNPS*3
 L 4,MBC*3
 BC 15,PRINT
T48K1 BC 15,MOVE
T48K2 BC 15,#+4

```

ADD TO PRINT BYPASS CODE  
PRINT BYPASS?

NEW PSN FOR 48K TEST  
BCW FOR 48K TEST

```

 X DIM TEST
 LH 8,CODELAD
 L 9,FADR2
 L 2,LADR7
 BAL 15,SUB1
 LH 6,CODEA1
 L 9,FADR2A
 L 2,LADR7A
 BAL 15,SUB1

```

```

• BIT DIM TEST
 MVI BABY+1,X'33'
 BAL 12,BDIM1

```

SLT SIK 2 CODE

```

* Y DIM TEST
 LH 5,CODECU
 BAL 12,YDIM1
 LH 5,CODECI
 MVI JCTR+1,X'00'
 BAL 12,YDIM1

```

CLR JUMP CTR

|              |             |
|--------------|-------------|
| * X DIM TEST | 12,10,11    |
| LH           | 8,CODEAU    |
| L            | 9,FADR3     |
| L            | 2,LADR8     |
| BAL          | 15,SUB1     |
| LH           | 8,CODEA1    |
| L            | 9,FADR3A    |
| L            | 2,LADR8A    |
| BAL          | 15,SUB1     |
| BC           | 15,532(U,U) |

RETURN TO 214 HEX, PRELUDE

```

0046D6 47 F 0 D 6DA
0046DA 93 01 E 1AC
0046DE 95 02 E 1AD
0046E2 47 8 0 D 6F6
0046E6 58 3 0 E 12C
0046EA 58 4 0 E 130
0046EE 47 F 0 D 5A6

```

```

0046F2 47 F 0 D 420
0046F6 48 8 0 E 1A8
0046FA 58 9 0 D F20
0046FE 58 2 0 D F60
004702 45 F 0 D E42
004706 48 8 0 E 1AA
00470A 58 9 0 D F30
00470E 58 2 0 D F8C
004712 45 F 0 D E42

```

```

004716 92 33 E 1B3
00471A 45 C 0 D 84E

```

```

00471E 48 5 0 E 1A4
004722 45 C 0 D 90E
004726 48 5 0 E 1A6
00472A 92 00 E 1B5
00472E 45 C 0 D 90E

```

```

004732 48 8 0 E 1A8
004736 58 9 0 D F24
00473A 58 2 0 D F68
00473E 45 F 0 D E42
004742 48 8 0 E 1AA
004746 58 9 0 D F34
00474A 58 2 0 D F94
00474E 45 F 0 D E42
004752 95 55 E 1B9
004756 47 8 0 D 796
00475A 95 55 E 1B8
00475E 47 8 0 D 80A
004762 47 F 0 D 214

```

```

* THE FOLLOWING ARE INITIAL LOADING AND SEQUENCE OF ROUTINES
* INSTRUCTIONS FOR TESTING 65K MEMORY

* 65K MEMORY TEST

```

```

T65K BC 15,++4
AI CODEX,X'01' ADD TO PRINT BYPASS CODE
CLI CODEX+1,X'02' PRINT BYPASS?
BC 8,U1S2A
L 3,MNPSW4 NEW PSW FOR 65K TEST
L 4,MBCW4 BCW DOE 65K TEST
BC 15,PRINT

```

```

* X DIM TEST
U1S2 BC 15,MOVE
U1S2A LH 8,CODEAU
L 9,FADR2
L 2,LADR7
BAL 15,SUB1
LH 8,CODEA1
L 9,FADR2A
L 2,LADR7A
BAL 15,SUB1

```

```

* BIT DIM TEST
MVI BABY+1,X'33' SET STK 2 CODE
BAL 12,BDIM1

```

```

* Y DIM TEST
LH 5,CODECU
BAL 12,YDIM1
LH 5,CODEC1
MVI JCTR+1,X'00' CLR JUMP CTR
BAL 12,YDIM1

```

```

* X DIM TEST
LH 8,CODEAU
L 9,FADR3
L 2,LADR9
BAL 15,SUB1
LH 8,CODEA1
L 9,FADR3A
L 2,LADR9A
BAL 15,SUB1
CLI COD98+1,X'55' 98K MEM?
BC 8,U2S1 YES, THEN JUMP
CLI COD131+1,X'55' 131K MEM?
BC 8,T131K3 YES, THEN JUMP
BC 15,532(0,0) RETURN TO 214 HEX, PRELUDE

```

```

* THE FOLLOWING ARE INITIAL LOADING AND SEQUENCE OF ROUTINES
* INSTRUCTIONS FOR TESTING 98K MEMORY

```

```

* 98K MEMORY TEST
T98K BC 15,++4
AI CODEX,X'01' ADD TO PRINT BYPASS CODE
CLI CODEX+1,X'02' PRINT BYPASS?
BC 8,T98K2
L 3,MNPSW5 NEW PSW FOR 98K TEST
L 4,MBCW5 BCW FOR 98K TEST
BC 15,PRINT

```

```

004766 47 F 0 D 76A
00476A 93 01 E 1AC
00476E 95 02 E 1AD
004772 47 8 0 D 786
004776 58 3 0 E 144
00477A 58 4 0 E 148
00477E 47 F 0 D 5A6

```



```
004782 47 F 0 0 420
004786 47 F 0 0 78A
00478A 92 55 E 1B9
00478E 47 F 0 0 6F2
004792 92 33 E 1B1
```

```
004796 92 00 E 1AF
00479A 45 C 0 0 88E
```

```
00479E 48 5 0 E 1A4
0047A2 45 C 0 0 96E
0047A6 48 5 0 E 1A6
0047AA 92 00 E 1B5
0047AE 45 C 0 0 96E
```

```
0047B2 48 8 0 E 1A8
0047B6 58 9 0 0 F28
0047BA 58 2 0 0 F6C
0047BE 45 F 0 0 E42
0047C2 48 8 0 E 1AA
0047C6 58 9 0 0 F38
0047CA 58 2 0 0 F98
0047CE 45 F 0 0 E42
0047D2 95 55 E 1B8
0047D6 47 F 0 0 80E
0047DA 47 F 0 0 214
```

```
0047DE 47 F 0 0 7E2
0047E2 93 01 E 1AC
0047E6 95 02 E 1AD
0047EA 47 8 0 0 7FE
0047EE 58 3 0 E 15C
0047F2 58 4 0 E 160
0047F6 47 F 0 0 5A6
0047FA 47 F 0 0 420
0047FE 47 F 0 0 802
004802 92 55 E 1B8
004806 47 F 0 0 6F2
00480A 47 F 0 0 796
```

```
00480E 92 00 E 1AF
004812 45 C 0 0 8CE
```

```
004816 48 5 0 E 1A4
00481A 45 C 0 0 9CE
00481E 48 5 0 E 1A6
004822 92 00 E 1B5
004826 45 C 0 0 9CE
```

```
00482A 48 8 0 E 1A8
00482E 58 9 0 0 F2C
004832 58 2 0 0 F70
004836 45 F 0 0 E42
00483A 48 8 0 E 1AA
00483E 58 9 0 0 F3C
```

```
T96K1 BC 15,MOVE
T96K2 BC 15,++4
MVI COD98+1,X'55' ENTER 96K MEM CODE
BC 15,U152
MVI UNIT+1,X'33' SET UNIT 2 CODE
* BIT DIM TEST
U251 MVI ACTR+1,X'00' CLR ADDRESS JUMP CTR, 501M
BAL 12,BDIM2
* Y DIM TEST
LH 5,CODECD
BAL 12,YDIM2
LH 5,CODEC1
MVI JCTR+1,X'00' CLR JUMP CTR
BAL 12,YDIM2
* X DIM TEST
LH 8,CODEAD
L 9,FADR4
L 2,LADR10
BAL 15,SUB1
LH 8,CODEA1
L 9,FADR4A
L 2,LDR10A
BAL 15,SUB1
CLI COD131+1,X'55' 131K MEM?
BC 8,U252
BC 15,532(0,0) RETURN TO 214 HEX, PRELUDE
```

```

* THE FOLLOWING ARE INITIAL LOADING AND SEQUENCE OF ROUTINES *
* INSTRUCTIONS FOR TESTING 131K MEMORY *

```

```
* 131K MEMORY TEST
T131K BC 15,++4
AI CODEX,X'01' ADD TO PRINT BYPASS CODE
CLI CODEX+1,X'02' PRINT BYPASS?
BC 8,T131K2
L 3,MNPSW6
L 4,MBCW6
BC 15,PRINT
T131K1 BC 15,MOVE
T131K2 BC 15,++4
MVI COD131+1,X'55' ENTER 131K MEM CODE
BC 15,U152
T131K3 BC 15,U251
* BIT DIM TEST
U252 MVI ACTR+1,X'00' CLR ADDRESS JUMP CTR, 501M
BAL 12,BDIM3
* Y DIM TEST
LH 5,CODECD
BAL 12,YDIM3
LH 5,CODEC1
MVI JCTR+1,X'00' CLR JUMP CTR
BAL 12,YDIM3
* X DIM TEST
LH 8,CODEAD
L 9,FADR5
L 2,LADR11
BAL 15,SUB1
LH 8,CODEA1
L 9,FADR5A
```

004842 58 2 0 0 F9C  
 004846 45 F 0 0 E42  
 00484A 47 F 0 0 214

```

 L 2,LDR11A
 BAL 15,SUB1
 BC 15,532(0,0) RETURN TO 214 HEX, PRELUDE
* THE FOLLOWING ARE INITIAL BIT DIM ADDRESS LOADING *

BDIM1 L 7,FA0R3
 BAL 15,BDIM
 L 7,BADR20
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR21
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR22
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR23
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR24
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR25
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR26
 BAL 15,BDIM BRANCH TO BDIM TEST
BDIM2 L 7,FA0R4
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR41
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR42
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR43
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR44
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR45
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR46
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR47
 BAL 15,BDIM BRANCH TO BDIM TEST
BDIM3 L 7,FA0R5
 BC 15,BDIM
 L 7,BADR51
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR52
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR53
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR54
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR55
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR56
 BAL 15,BDIM BRANCH TO BDIM TEST
 L 7,BADR57
 BAL 15,BDIM BRANCH TO BDIM TEST

* THE FOLLOWING ARE INITIAL Y DIM ADDRESS LOADING *

YDIM1 L 6,FA0R3
 L 7,LA0R2

```

00490E 58 6 0 0 F24  
 004912 58 7 0 0 F4C

|        |    |   |   |   |     |
|--------|----|---|---|---|-----|
| 004916 | 45 | F | U | D | ADA |
| 00491A | 58 | 6 | U | E | U1C |
| 00491E | 58 | 7 | U | E | U7D |
| 004922 | 45 | F | U | D | ADA |
| 004926 | 58 | 6 | U | E | U20 |
| 00492A | 58 | 7 | U | E | U74 |
| 00492E | 45 | F | U | D | ADA |
| 004932 | 58 | 6 | U | E | U24 |
| 004936 | 58 | 7 | U | E | U78 |
| 00493A | 45 | F | U | D | ADA |
| 00493E | 58 | 6 | U | E | U28 |
| 004942 | 58 | 7 | U | E | U7C |
| 004946 | 45 | F | U | D | ADA |
| 00494A | 58 | 6 | U | E | U2C |
| 00494E | 58 | 7 | U | E | U80 |
| 004952 | 45 | F | U | D | ADA |
| 004956 | 58 | 6 | U | E | U30 |
| 00495A | 58 | 7 | U | E | U84 |
| 00495E | 45 | F | U | D | ADA |
| 004962 | 58 | 6 | U | E | U34 |
| 004966 | 58 | 7 | U | E | U88 |
| 00496A | 45 | F | U | D | ADA |
| 00496E | 58 | 6 | U | D | F28 |
| 004972 | 58 | 7 | U | D | F50 |
| 004976 | 45 | F | U | D | ADA |
| 00497A | 58 | 6 | U | E | U38 |
| 00497E | 58 | 7 | U | E | U8C |
| 004982 | 45 | F | U | D | ADA |
| 004986 | 58 | 6 | U | E | U3C |
| 00498A | 58 | 7 | U | E | U90 |
| 00498E | 45 | F | U | D | ADA |
| 004992 | 58 | 6 | U | E | U40 |
| 004996 | 58 | 7 | U | E | U94 |
| 00499A | 45 | F | U | D | ADA |
| 00499E | 58 | 6 | U | E | U44 |
| 0049A2 | 58 | 7 | U | E | U98 |
| 0049A6 | 45 | F | U | D | ADA |
| 0049AA | 58 | 6 | U | E | U48 |
| 0049AE | 58 | 7 | U | E | U9C |
| 0049B2 | 45 | F | U | D | ADA |
| 0049B6 | 58 | 6 | U | E | U4C |
| 0049BA | 58 | 7 | U | E | UA0 |
| 0049BE | 45 | F | U | D | ADA |
| 0049C2 | 58 | 6 | U | E | U50 |
| 0049C6 | 58 | 7 | U | E | UA4 |
| 0049CA | 45 | F | U | D | ADA |
| 0049CE | 58 | 6 | U | D | F2C |
| 0049D2 | 58 | 7 | U | D | F54 |
| 0049D6 | 45 | F | U | D | ADA |
| 0049DA | 58 | 6 | U | E | U54 |
| 0049DE | 58 | 7 | U | E | UA8 |
| 0049E2 | 45 | F | U | D | ADA |
| 0049E6 | 58 | 6 | U | E | U58 |
| 0049EA | 58 | 7 | U | E | UAC |
| 0049EE | 45 | F | U | D | ADA |
| 0049F2 | 58 | 6 | U | E | U5C |
| 0049F6 | 58 | 7 | U | E | U80 |
| 0049FA | 45 | F | U | D | ADA |
| 0049FE | 58 | 6 | U | E | U60 |

YDIM2

YDIM3

|     |         |
|-----|---------|
| BAL | 15,SUB2 |
| L   | 6,FDR29 |
| L   | 7,LDR29 |
| BAL | 15,SUB2 |
| L   | 6,FDR30 |
| L   | 7,LDR30 |
| BAL | 15,SUB2 |
| L   | 6,FDR31 |
| L   | 7,LDR31 |
| BAL | 15,SUB2 |
| L   | 6,FDR32 |
| L   | 7,LDR32 |
| BAL | 15,SUB2 |
| L   | 6,FDR33 |
| L   | 7,LDR33 |
| BAL | 15,SUB2 |
| L   | 6,FDR34 |
| L   | 7,LDR34 |
| BAL | 15,SUB2 |
| L   | 6,FDR35 |
| L   | 7,LDR35 |
| BAL | 15,SUB2 |
| L   | 6,FADR4 |
| L   | 7,LADR3 |
| BAL | 15,SUB2 |
| L   | 6,FDR43 |
| L   | 7,LDR43 |
| BAL | 15,SUB2 |
| L   | 6,FDR44 |
| L   | 7,LDR44 |
| BAL | 15,SUB2 |
| L   | 6,FDR45 |
| L   | 7,LDR45 |
| BAL | 15,SUB2 |
| L   | 6,FDR46 |
| L   | 7,LDR46 |
| BAL | 15,SUB2 |
| L   | 6,FDR47 |
| L   | 7,LDR47 |
| BAL | 15,SUB2 |
| L   | 6,FDR48 |
| L   | 7,LDR48 |
| BAL | 15,SUB2 |
| L   | 6,FDR49 |
| L   | 7,LDR49 |
| BAL | 15,SUB2 |
| L   | 6,FADR5 |
| L   | 7,LADR4 |
| BAL | 15,SUB2 |
| L   | 6,FDR57 |
| L   | 7,LDR57 |
| BAL | 15,SUB2 |
| L   | 6,FDR58 |
| L   | 7,LDR58 |
| BAL | 15,SUB2 |
| L   | 6,FDR59 |
| L   | 7,LDR59 |
| BAL | 15,SUB2 |
| L   | 6,FDR60 |

```

004A02 58 7 0 E UB4
004A06 45 F 0 D ADA
004A0A 58 6 0 E U64
004A0E 58 7 0 E UB8
004A12 45 F 0 D ADA
004A16 58 6 0 E U68
004A1A 58 7 0 E UBC
004A1E 45 F 0 D ADA
004A22 58 6 0 E U6C
004A26 58 7 0 E UCO
004A2A 45 F 0 D ADA

```

```

L 7,LDR60
BAL 15,SUB2
L 6,FDR61
L 7,LDR61
BAL 15,SUB2
L 6,FDR62
L 7,LDR62
BAL 15,SUB2
L 6,FDR63
L 7,LDR63
BAL 15,SUB2

```

```


*
*

*

```

## BIT DIM TEST

```

004A2E 18 4 7
004A30 93 01 E 1AE
004A34 58 2 0 E 198
004A38 40 2 0 4 000
004A3C 58 2 0 E 19C
004A40 40 2 0 4 000
004A44 49 2 0 4 000
004A48 47 8 0 D A84
004A4C 95 08 E 1AF
004A50 47 8 0 D A58
004A54 47 F 0 F 000
004A58 48 3 0 4 000
004A5C 95 55 E 1B1
004A60 47 8 0 D A70
004A64 95 55 E 1B3
004A68 47 8 0 D A7C
004A6C 99 00 3 000
004A70 95 55 E 1B3
004A74 47 8 0 D A80
004A78 99 00 3 000
004A7C 99 00 3 000
004A80 99 00 3 000
004A84 58 2 0 E 198
004A88 18 4 7
004A8A 40 2 0 4 000
004A8E 49 2 0 4 000
004A92 47 8 0 D AD2
004A96 95 08 E 1AF
004A9A 47 8 0 D AA2
004A9E 47 F 0 F 000
004AA2 48 3 0 4 000
004AA6 95 55 E 1B1
004AAA 47 8 0 D ABA
004AAE 95 55 E 1B3
004AB2 47 8 0 D AC6
004AB6 99 00 3 000
004ABA 95 55 E 1B3
004ABE 47 8 0 D ACA
004AC2 99 00 3 000
004AC6 99 00 3 000
004ACA 99 00 3 000

```

```

RDIM LR 4,7
AI ACTR,X'01
L 2,ONS
STH 2,U(0,4)
L 2,ZERUES
STH 2,U(0,4)
CH 2,U(0,4)
HC 8,NEXT
CLI ACTR+1,X'08'
BC 8,ERR1
BC 15,U(0,15)
LH 3,U(0,4)
ERR1 CLI UNIT+1,X'55'
BC 8,JIM
CLI BABY+1,X'55'
BC 8,JEM
HPR U(3)
JIM CLI BABY+1,X'55'
BC 8,JAB
HPR U(3)
JEN HPR U(3)
JAB HPR U(3)
NEXT L 2,ONS
LR 4,7
STH 2,U(0,4)
CH 2,U(0,4)
BC 8,BEN
CLI ACTR+1,X'08'
BC 8,ERR2
BC 15,U(0,15)
ERR2 LH 3,U(0,4)
CLI UNIT+1,X'55'
BC 8,JIM1
CLI BABY+1,X'55'
BC 8,JEM1
HPR U(3)
JIM1 CLI BABY+1,X'55'
BC 8,JAB1
HPR U(3)
JEN1 HPR U(3)
JAB1 HPR U(3)

```

```

LOAD REG4 WITH ADDRESS
ADD TO ADDRESS JUMP CTR
LOAD ONES PIN
WRITE ONES
LOAD ZERUES PIN
WRITE ZEROS
READ & TEST
IF NO FAILURE, JUMP
LAST ADDRESS JUMP?
YES, THEN ERROR RTN
RETURN TO MAIN RTN
LOAD FAILURE DATA
UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP
UNIT 2, STACK 2
STACK 1?
YES, THEN JUMP
UNIT 1, STACK 2 FAILURE
UNIT 2, STACK 1 FAILURE
UNIT 1, STACK 1 FAILURE
LOAD ONES PIN
LOAD ADDRESS
WRITE ONES
READ & TEST
IF NO FAILURE, JUMP
LAST ADDRESS JUMP?
YES, THEN ERROR RTN
RETURN TO MAIN RTN
LOAD FAILURE DATA
UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP
UNIT 2, STACK 2
STACK 1?
JUMP IF STK 1
UNIT 1, STACK 2 FAILURE
UNIT 2, STACK 1 FAILURE
UNIT 1, STACK 1 FAILURE

```

```
004ACE 47 F 0 D AD6
004AD2 47 F 0 D AD6
004AD6 47 F 0 C 000
```

|        |    |    |   |     |     |
|--------|----|----|---|-----|-----|
| 004ADA | 18 | 1  | C |     |     |
| 004ADC | 93 | 01 | E | 184 |     |
| 004AEO | 49 | 5  | O | E   | 1A4 |
| 004AE4 | 47 | 8  | O | D   | AF0 |
| 004AE8 | 5A | 6  | O | E   | 1A0 |
| 004AEC | 5A | 7  | O | E   | 1A0 |
| 004AF0 | 58 | A  | O | E   | 198 |
| 004AF4 | 58 | B  | O | E   | 19C |
| 004AF8 | 58 | C  | O | E   | 19C |
| 004AFC | 58 | 2  | O | E   | 19C |
| 004B00 | 18 | 3  | 6 |     |     |
| 004B02 | 92 | 00 | E | 175 |     |
| 004B06 | 92 | 00 | 3 | 000 |     |
| 004B0A | 95 | 00 | 3 | 000 |     |
| 004B0E | 47 | 8  | O | D   | 81E |
| 004B12 | 93 | 01 | E | 174 |     |
| 004B16 | 14 | A  | 3 |     |     |
| 004B18 | 54 | B  | O | 3   | 000 |
| 004B1C | 17 | C  | 3 |     |     |
| 004B1E | 5A | 3  | O | D   | F44 |
| 004B22 | 19 | 3  | 7 |     |     |
| 004B24 | 47 | 6  | O | D   | 806 |
| 004B28 | 95 | 00 | E | 175 |     |
| 004B2C | 47 | 8  | O | D   | 880 |
| 004B30 | 95 | 08 | E | 185 |     |
| 004B34 | 47 | 8  | O | D   | 83C |
| 004B38 | 47 | F  | O | F   | 000 |
| 004B3C | 43 | 2  | O | E   | 175 |
| 004B40 | 95 | 55 | E | 181 |     |
| 004B44 | 47 | 8  | O | D   | 860 |
| 004B48 | 95 | 55 | E | 183 |     |
| 004B4C | 47 | 8  | O | D   | 870 |
| 004B50 | 49 | 5  | O | E   | 1A4 |
| 004B54 | 47 | 8  | O | D   | 85C |
| 004B58 | 99 | 00 | B | 000 |     |
| 004B5C | 99 | 00 | B | 000 |     |
| 004B60 | 49 | 5  | O | E   | 1A4 |
| 004B64 | 47 | 8  | O | D   | 86C |
| 004B68 | 99 | 00 | B | 000 |     |
| 004B6C | 99 | 00 | B | 000 |     |
| 004B70 | 49 | 5  | O | E   | 1A4 |
| 004B74 | 47 | 8  | O | D   | 87C |
| 004B78 | 99 | 00 | B | 000 |     |
| 004B7C | 99 | 00 | B | 000 |     |
| 004B80 | 58 | C  | O | E   | 198 |
| 004B84 | 18 | 3  | 6 |     |     |
| 004B88 | 92 | FF | 3 | 000 |     |
| 004B8A | 95 | FF | 3 | 000 |     |
| 004B8E | 47 | 8  | O | D   | 89E |
| 004B92 | 93 | 01 | E | 174 |     |
| 004B96 | 14 | A  | 3 |     |     |

|      |            |            |
|------|------------|------------|
| BEN  | BC         | 15,DOE     |
| DOE  | BC         | 15,**+4    |
| *    | BC         | 15,0(0,12) |
| *    | *          | *          |
| *    | *          | *          |
| **** | Y DIM TEST | NON SELECT |
| *    | *          | *          |
| *    | *          | *          |
| SUB2 | LR         | 1,12       |
|      | AI         | JCTR,X*01' |
|      | CH         | 5,CODECD   |
|      | BC         | 8,DAN      |
|      | A          | 6,ONE      |
|      | A          | 7,ONE      |
| DAN  | L          | 10,ONS     |
|      | L          | 11,ZER0ES  |
|      | L          | 12,ZER0ES  |
|      | L          | 2,ZER0ES   |
|      | LR         | 3,6        |
| FINI | MVI        | CTR+1,X*00 |
|      | MVI        | 0(3),X*00' |
|      | CLI        | 0(3),X*00' |
|      | BC         | 8,MAT      |
|      | AI         | CTR,X*01'  |
|      | NR         | 10,3       |
|      | N          | 11,0(0,3)  |
|      | XR         | 12,3       |
| MAT  | A          | 3,DADR3    |
|      | CR         | 3,7        |
|      | BC         | 6,FINI     |
|      | CLI        | CTR+1,X*00 |
|      | BC         | 8,MUD      |
|      | CLI        | JCTR+1,X*0 |
|      | BC         | 8,ERR3     |
| ERR3 | BC         | 15,0(0,15) |
|      | IC         | 2,CTR+1    |
|      | CLI        | UNIT+1,X*5 |
|      | BC         | 8,KAT      |
|      | CLI        | BABY+1,X*5 |
|      | RC         | 8,GAT      |
|      | CH         | 5,CODECD   |
|      | BC         | 8,NAT      |
| NAT  | HPR        | 0(11)      |
| RAI  | HPR        | 0(11)      |
|      | CH         | 5,CODECD   |
|      | BC         | 8,EAT      |
| EAT  | HPR        | 0(11)      |
| GAT  | HPR        | 0(11)      |
|      | CH         | 5,CODECD   |
|      | BC         | 8,PAT      |
| PAT  | HPR        | 0(11)      |
| MUD  | HPR        | 0(11)      |
|      | L          | 12,ONS     |
|      | LR         | 3,6        |
| GAT  | MVI        | 0(3),X*FF' |
|      | CLI        | 0(3),X*FF' |
|      | BC         | 8,SAT      |
|      | AI         | CTR,X*01'  |
|      | NR         | 10,3       |

```
EXIT
RTN JUMP EXIT
```

```

LOAD R1 WITH FADR
ADD TO ADDRESS JUMP CTR
TEST BYTE 0?
IF BYTE 0, JUMP
MAKE FAUR BYTE 1 ADDRESS
MAKE LAUR BYTE 1 ADDRESS
SET R10 TO ONES
CLEAR R11
CLEAR R12
CLEAR R2
LOAD R3 WITH FADR
CLR CTR
WRITE ZEROES
READ & TEST FOR ZEROS
IF TEST OK, JUMP
INC CTR BY ONE
AND FAILING ADDRESS
AND FAILURE DATA
XOR FAILING ADDRESS
INC ADDRESS
LAST ADDRESS?
NO, THEN REPEAT RTN
TEST FOR ZERO FAILURES

LAST ADDRESS JUMP?
YES, THEN ERROR RTN
RETURN TO MAIN RTN
STORE ERROR COUNT
UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 2, BYTE 1 FAILURE
UNIT 2, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 1, STACK 2, BYTE 1 FAILURE
UNIT 1, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 1, BYTE 1 FAILURE
UNIT 2, STACK 1, BYTE 0 FAILURE
SET R12 TO ONES
LOAD R3 WITH FADR
WRITE ONES
READ & TEST FOR ONES
IF TEST OK JUMP
INC FAILURE COUNTER
AND FAILING ADDRESS

```

|      |     |              |
|------|-----|--------------|
|      | N   | 11,0(0,3)    |
|      | XR  | 12,3         |
| SAT  | A   | 3,DADR3      |
|      | CK  | 3,7          |
|      | BC  | 6,GIN        |
|      | CLI | CTR+1,X'00'  |
|      | BC  | 8,FUN        |
|      | CLI | BCTR+1,X'08' |
|      | BC  | 8,ERR4       |
|      | BC  | 15,0(0,15)   |
| ERR4 | IC  | 2,CTR+1      |
|      | CLI | UNIT+1,X'55' |
|      | BC  | 8,RAT1       |
|      | CLI | BABY+1,X'55' |
|      | BC  | 8,GAT1       |
|      | CH  | 5,CODECD     |
|      | BC  | 8,NAT1       |
|      | HPR | 0(11)        |
| NAT  | HPR | 0(11)        |
| RAT1 | CH  | 5,CODECD     |
|      | BC  | 8,EAT1       |
|      | HPR | 0(11)        |
| EAT1 | HPR | 0(11)        |
| GAT1 | CH  | 5,CODECD     |
|      | BC  | 8,PAT1       |
|      | HPR | 0(11)        |
| PAT1 | HPR | 0(11)        |
| FUN  | BC  | 15,SUB3      |

```

AND FAILING ADDRESS
XOR FAILING ADDRESS
INC ADDRESS
LAST ADDRESS?
NO, THEN REPEAT RTN
TEST FAILURE COUNTER FOR ZERO
IF ZERO, EXIT
LAST ADDRESS JUMP?
YES, THEN ERROR RTN
RETURN TO MAIN RTN
STORE ERROR COUNT
UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 2, BYTE 1 FAILURE
UNIT 2, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 1, STACK 2, BYTE 1 FAILURE
UNIT 1, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 1, BYTE 1 FAILURE
UNIT 2, STACK 1, BYTE 0 FAILURE
BRANCH TO SEL RTN

```

```

 * * * *
 * * * *
 * * * *
 ***** YDIM TEST HALF BIT CURRENT, ZEROS
 * * * *
 * * * *
SUB3 LR 9.6

```

|        |    |    |   |       |
|--------|----|----|---|-------|
| 004C04 | 18 | 9  | 6 |       |
| 004C06 | 92 | 00 | E | 170   |
| 004C0A | 58 | A  | 0 | E 198 |
| 004C0E | 58 | B  | 0 | E 19C |
| 004C12 | 58 | C  | 0 | E 19C |
| 004C16 | 58 | 2  | 0 | E 19C |
| 004C1A | 92 | 00 | E | 179   |
| 004C1E | 18 | 8  | 6 |       |
| 004C20 | 92 | 00 | E | 179   |
| 004C24 | 92 | 01 | 8 | 000   |
| 004C28 | 93 | 01 | E | 178   |
| 004C2C | 95 | 64 | E | 179   |
| 004C30 | 47 | 6  | 0 | C24   |
| 004C34 | 5A | 8  | 0 | D F44 |
| 004C38 | 19 | 8  | 7 |       |
| 004C3A | 47 | 6  | 0 | D C20 |
| 004C3E | 92 | 00 | E | 179   |
| 004C42 | 18 | 8  | 6 |       |
| 004C44 | 92 | FF | 9 | 000   |
| 004C48 | 93 | 01 | E | 178   |
| 004C4C | 95 | 64 | E | 179   |
| 004C50 | 47 | 6  | 0 | D C44 |
| 004C54 | 19 | 9  | 8 |       |
| 004C56 | 47 | 8  | 0 | D C6E |
| 004C5A | 95 | 01 | 8 | 000   |
| 004C5E | 47 | 8  | 0 | D C6E |

|      |     |              |
|------|-----|--------------|
| SUB3 | LR  | 9,6          |
|      | MVI | BCTR+1,X'DD' |
|      | L   | 10,ONS       |
|      | L   | 11,ZERUES    |
|      | L   | 12,ZERUES    |
|      | L   | 2,ZERUES     |
| FAT  | MVI | XCTR+1,X'DD' |
|      | LR  | 8,6          |
| SAD  | MVI | XCTR+1,X'DD' |
| SAN  | MVI | U(8),X'DD'   |
|      | AI  | XCTR,X'DI'   |
|      | CLI | XCTR+1,X'64' |
|      | BC  | 6,SAM        |
|      | A   | 8,DADR3      |
|      | CK  | 8,7          |
|      | BC  | 6,SAD        |
|      | MVI | XCTR+1,X'DD' |
|      | LR  | 8,6          |
| BAB  | MVI | U(9),X'FF'   |
|      | AI  | XCTR,X'DI'   |
|      | CLI | XCTR+1,X'64' |
|      | BC  | 6,BAB        |
| JOE  | CK  | 9,8          |
|      | BC  | 8,CAR        |
|      | CLI | U(8),X'DD'   |
|      | BC  | 8,CAR        |

```

LOAD R9 WITH FADR
CLR BCTR
SET R10 TO ONES
CLEAR R11
CLEAR R12
CLEAR R2
CLR XCTR
LOAD R8 WITH FADR
CLR XCTR
WRITE ZEROS
INC XCTR
WRITE 100 TIMES
BRANCH UNTIL WRITE 100 TIMES
INC ADDRESS
LAST ADDRESS?
NO, THEN REPEAT RTN
CLR XCTR
LOAD R8 WITH FADR
WRITE ONES
INC XCTR
WRITE 100 TIMES
BRANCH UNTIL WRITE 100 TIMES
COMPARE ADDRESS REGISTERS
IF EQUAL, JUMP
READ & TEST FOR ZEROS
EXIT IF TEST OK

```

SUE 10

|     |      |   |              |
|-----|------|---|--------------|
| AI  |      |   | BCTR,X'01'   |
| NR  |      |   | 10,8         |
| N   |      |   | 11,U(0,8)    |
| XK  |      |   | 12,8         |
| A   |      |   | 8,DADR3      |
| CR  |      |   | 8,7          |
| BC  |      |   | 6,JOE        |
| CLI |      |   | BCTR+1,X'01' |
| BC  |      |   | 8,SOUL       |
| A   |      |   | 9,DADR3      |
| CR  |      |   | 9,7          |
| BC  |      |   | 6,FAT        |
| CLI |      |   | BCTR+1,X'00' |
| BC  |      |   | 8,MOE        |
| LH  |      |   | 2,BCTR       |
| CLI |      |   | UNIT+1,X'55' |
| BC  |      |   | 8,RAT2       |
| CLI |      |   | BABY+1,X'55' |
| BC  |      |   | 8,GAT2       |
| CH  |      |   | 5,CODECO     |
| HC  |      |   | 8,NAT2       |
| HPR |      |   | U(11)        |
| HPR |      |   | U(11)        |
| CH  |      |   | 5,CODECO     |
| BC  |      |   | 8,EAT2       |
| HPR |      |   | U(11)        |
| HPR |      |   | U(11)        |
| CH  |      |   | 5,CODECO     |
| BC  |      |   | 8,PAT2       |
| HPR |      |   | U(11)        |
| HPR |      |   | U(11)        |
| BC  |      |   | 15,SUB10     |
| BC  |      |   | 15,*+4       |
| CLI |      |   | UNIT+1,X'55' |
| BC  |      |   | 8,RAT3       |
| CLI |      |   | BABY+1,X'55' |
| BC  |      |   | 8,GAT3       |
| CH  |      |   | 5,CODECO     |
| BC  |      |   | 8,NAT3       |
| HPR |      |   | U(11)        |
| HPR |      |   | U(11)        |
| CH  |      |   | 5,CODECO     |
| BC  |      |   | 8,PAT3       |
| HPR |      |   | U(11)        |
| HPR |      |   | U(11)        |
| BC  |      |   | 15,SUB10     |
| *   | *    | * | *            |
| *   | *    | * | *            |
| DIM | TEST |   | HALF BIT COR |
| *   | *    | * | *            |
| *   | *    | * | *            |
| LK  |      |   | 9,6          |
| MVI |      |   | BCTR+1,X'00' |
| L   |      |   | 10,ONS       |
| L   |      |   | 11,ZEROES    |

```

INC FAILURE COUNTER
AND FAILURE ADDRESS
AND FAILING ADDRESS
XOR FAILURE ADDRESS
INC ADDRESS
LAST ADDRESS?
NO, THEN REPEAT RTN
TEST FAILURE CTR
IF BCTR EQUALS ONE, EXIT
INC ADDRESS OF WRITE REG
LAST ADDRESS?
NO, THEN REPEAT RTN
TEST FAILURE CTR FOR ZERO
IF ZERO, EXIT
LOAD R2 WITH FAILURE COUNT
UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 2, BYTE 1 FAILURE
UNIT 2, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 1, STACK 2, BYTE 1 FAILURE
UNIT 1, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 1, BYTE 1 FAILURE
UNIT 2, STACK 1, BYTE 0 FAILURE
BRANCH TO NEXT RTN

UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 2, BYTE 1 FAILURE
UNIT 2, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 1, STACK 2, BYTE 1 FAILURE
UNIT 1, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 1, BYTE 1 FAILURE
UNIT 2, STACK 1, BYTE 0 FAILURE

```

```

004030 58 C 0 E 19C
004034 58 2 0 E 19C
004038 92 00 E 179
00403C 18 8 6
00403E 92 00 E 179
004042 92 FF 6 000
004046 93 01 E 178
00404A 95 64 E 179
00404E 47 6 0 D 042
004052 5A 8 0 D F44
004056 19 8 7
004058 47 6 0 D 03E
00405C 92 00 E 179
004060 18 8 6
004062 92 00 9 000
004066 93 01 E 178
00406A 95 64 E 179
00406E 47 6 0 D 062
004072 19 9 8
004074 47 8 0 D 08C
004078 95 FF 8 000
00407C 47 8 0 D 08C
004080 93 01 E 17C
004084 14 A 8
004086 54 8 0 8 000
00408A 17 C 8
00408C 5A 8 0 D F44
004090 19 8 7
004092 47 6 0 D 072
004096 95 01 E 17D
00409A 47 8 0 D 0F8
00409E 5A 9 0 D F44
0040A2 19 9 7
0040A4 47 6 0 D 038
0040A8 95 00 E 17D
0040AC 47 8 0 D E3C
0040B0 48 2 0 E 17C
0040B4 95 55 E 1B1
0040B8 47 8 0 D 0D4
0040BC 95 55 E 1B3
0040C0 47 8 0 D 0E4
0040C4 49 5 0 E 1A4
0040C8 47 8 0 D 0D0
0040CC 99 00 6 000
0040D0 99 00 8 000
0040D4 49 5 0 E 1A4
0040D8 47 8 0 D 0E0
0040DC 99 00 6 000
0040E0 99 00 8 000
0040E4 49 5 0 E 1A4
0040E8 47 8 0 D 0F0
0040EC 99 00 8 000
0040F0 99 00 8 000
0040F4 47 F 0 F 000
0040F8 47 F 0 D 0FC
0040FC 95 55 E 1B1
004E00 47 8 0 D E1C
004E04 95 55 E 1B3
004E08 47 8 0 D E2C

```

FATS

SADS  
SADS

BABS

JOES

CARS

NAT4  
RAT4EAT4  
GAT4

PAT4

DO..

```

L
L
MVI
LR
MVI
MVI
AI
CLI
BC
A
CR
BC
MVI
LR
MVI
AI
CLI
BC
CR
BC
CLI
BC
AI
NR
N
XR
A
CR
BC
CLI
BC
A
CR
BC
CLI
BC
LH
CLI
BC
CLI
BC
CH
BC
HPR
HPR
CH
BC
HPR
HPR
CH
BC
HPR
HPR
BC
BC
CLI
BC
CLI
BC

```

```

12,ZEROES
2,ZEROES
XCTR+1,X'00'
8,6
XCTR+1,X'00'
0(8),X'FF'
XCTR,X'01'
XCTR+1,X'64'
6,SADS
8,DADR3
8,7
6,SADS
XCTR+1,X'00'
8,6
0(9),X'00'
XCTR,X'01'
XCTR+1,X'64'
6,BABS
9,8
8,CARS
0(8),X'FF'
8,CARS
BCTR,X'01'
10,8
11,0(0,8)
12,8
8,DADR3
8,7
6,JOES
BCTR+1,X'01'
8,DOW
9,DADR3
9,7
6,FATS
BCTR+1,X'00'
8,MOES
2,BCTR
UNIT+1,X'55'
8,RAT4
BABY+1,X'55'
8,GAT4
5,CODECO
8,NAT4
0(11)
0(11)
5,CODECO
8,EAT4
0(11)
0(11)
5,CODECO
8,PAT4
0(11)
0(11)
15,0(0,15)
15,*+4
UNIT+1,X'55'
8,RAT5
BABY+1,X'55'
8,GAT5

```

```

CLEAR R12
CLEAR R2
CLR ACTR
LOAD R8 WITH FADR
CLR ACTR
WRITE ONES
INC ACTR
WRITE 100 TIMES
BRANCH UNTIL WRITE 100 TIMES
INC ADDRESS
LAST ADDRESS?
NO, THEN REPEAT RTN
CLR ACTR
LOAD R8 WITH FADR
WRITE ZEROS
INC XCTR
WRITE 100 TIMES
BRANCH UNTIL WRITE 100 TIMES
COMPARE ADDRESS REGISTERS
IF EQUAL, JUMP
READ & TEST FOR ZEROS
EXIT IF TEST OK
INC FAILURE COUNTER
AND FAILURE ADDRESS
AND FAILURE DATA
XOR FAILURE ADDRESS
INC ADDRESS
LAST ADDRESS?
NO, THEN REPEAT RTN
TEST FAILURE CTR
IF BCTR EQUALS ONE, EXIT
INC ADDRESS OF WRITE REG
LAST ADDRESS?
NO, THEN REPEAT RTN
TEST FAILURE CTR FOR ZERO
IF ZERO, EXIT
LOAD R2 WITH FAILURE COUNT
UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 2, BYTE 1 FAILURE
UNIT 2, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 1, STACK 2, BYTE 1 FAILURE
UNIT 1, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 1, BYTE 1 FAILURE
UNIT 2, STACK 1, BYTE 0 FAILURE
BRANCH TO MAIN RTN

UNIT 1?

STACK 1?
YES, THEN JUMP

```



```

004E0C 49 5 0 E 1A4
004E10 47 8 0 D E18
004E14 99 00 B 000
004E18 99 00 B 000
004E1C 49 5 0 E 1A4
004E20 47 8 0 D E28
004E24 99 00 B 000
004E28 99 00 B 000
004E2C 49 5 0 E 1A4
004E30 47 8 0 D E38
004E34 99 00 B 000
004E38 99 00 B 000
004E3C 16 C 1
004E3E 47 F 0 C 000

```

```

004E42 58 1 0 D F40
004E46 58 5 0 E 19C
004E4A 18 4 9
004E4C 58 3 0 E 19C
004E50 58 6 0 E 19C
004E54 58 A 0 E 198
004E58 58 7 0 E 198
004E5C 58 8 0 E 194
004E60 42 3 0 4 000
004E64 58 B 0 E 1A0
004E68 47 2 0 D E60
004E6C 58 3 0 E 198
004E70 42 3 0 4 000
004E74 95 FF 4 000
004E78 47 8 0 D E88
004E7C 5A 5 0 E 1A0
004E80 17 6 4
004E82 14 A 4
004E84 47 F 0 D EB2
004E88 58 8 0 E 194
004E8C 42 3 0 4 000
004E90 58 B 0 E 1A0
004E94 47 2 0 D E8C
004E98 58 3 0 E 19C
004E9C 42 3 0 4 000
004EA0 95 00 4 000
004EA4 47 8 0 D E80
004EA8 5A 5 0 E 1A0
004EAC 17 6 4
004EAE 14 A 4
004EB0 14 7 4
004EB2 1A 4 1
004EB4 19 4 2
004EB6 47 6 0 D E5C
004EBA 59 5 0 E 19C
004FBE 47 8 0 D F1A
004EC2 95 55 E 1B1
004EC6 47 8 0 D EE2
004ECA 95 55 E 1B3
004ECE 47 8 0 D EFA

```

```

 CH 5, CODECD
 BC 8, NAT5
 HPR 0(11)
NAT5 HPR 0(11)
RAT5 CH 5, CODECD
 BC 8, EAT5
 HPR 0(11)
EAT5 HPR 0(11)
GAT5 CH 5, CODECD
 BC 8, PAT5
 HPR 0(11)
PAT5 HPR 0(11)
MOES LK 12, 1
 BC 15, 0(0, 12)

**** X DIM TEST

SUB1 L 1, DADR1
 L 5, ZEROES
 LR 4, 9
 L 3, ZEROES
 L 6, ZEROES
 L 10, ONS
 L 7, ONS
CAN L 11, ACNT
DUG STC 3, 0(0, 4)
 S 11, ONE
 BC 2, DUG
 L 3, ONS
 STC 3, 0(0, 4)
 CLI 0(4), X'FF'
 BC 8, JON
 A 5, ONE
 XR 6, 4
 NR 10, 4
 BC 15, CAN
 L 11, ACNT
 STC 3, 0(0, 4)
 S 11, ONE
 BC 2, CAD
 L 3, ZEROES
 STC 3, 0(0, 4)
 CLI 0(4), X'00'
 BC 8, DAD
 A 5, ONE
 XR 6, 4
 NR 10, 4
 NR 7, 4
 AR 4, 1
 CR 4, 2
 BC 6, CAN
 C 5, ZEROES
 BC 8, TOM
 CLI UNIT+1, X'55'
 BC 8, RAT6
 CLI BABY+1, X'55'
 BC 8, GAT6

```

```

BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 2, BYTE 1 FAILURE
UNIT 2, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 1, STACK 2, BYTE 1 FAILURE
UNIT 1, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 1, BYTE 1 FAILURE
UNIT 2, STACK 1, BYTE 0 FAILURE
LOAD BAL ADDRESS
BRANCH TO MAIN RIN

```

```

LOAD R1 WITH DELTA ADDRESS
CLR R5
LOAD R4 WITH FADR
LOAD R3 WITH ZERO PTN
CLR R6
SET R10 TO ONES
SET R7 TO ONES
LOAD R11 WITH COUNT OF 100
WRITE ZEROS
SUBTRACT ONE FROM COUNT
REPEAT TILL WRITE 100 TIMES
LOAD ONS PTN
WRITE ONS ONCE
READ & TEST
IF OK, DO ONS TEST
ADD 1 TO ERROR CTR
XOR FAILURE ADDRESS
AND FAILURE ADDRESS
JUMP TO NEXT ADDRESS
LOAD R11 WITH COUNT OF 100
WRITE ONS
SUBTRACT ONE FROM COUNT
REPEAT TILL WRITE 100 TIMES
LOAD R3 WITH ZERO PTN
WRITE ZEROS ONCE
READ & TEST
IF OK, REPEAT AT NEW ADDRESS
ADD ONE TO ERROR CTR
XOR FAILURE ADDRESS
AND FAILURE ADDRESS
AND GOOD ADDRESS
INCREMENT ADDRESS
LAST ADDRESS?
NO, THEN REPEAT
TEST IF ANY FAILURES RECORDED
NO FAILURES, EXIT
UNIT 1?
YES, THEN JUMP
STACK 1?
YES, THEN JUMP

```

```

004ED2 49 8 0 E 1A8
004ED6 47 8 0 0 EDE
004EDA 99 00 5 000
004EDE 99 00 5 000
004EE2 95 55 E 1B3
004EE6 47 8 0 0 F0A
004EEA 49 8 0 E 1A8
004EEE 47 8 0 0 EF6
004EF2 99 00 5 000
004EF6 99 00 5 000
004EFA 49 8 0 E 1A8
004EFE 47 8 0 0 F06
004F02 99 00 5 000
004F06 99 00 5 000
004F0A 49 8 0 E 1A8
004F0E 47 8 0 0 F16
004F12 99 00 5 000
004F16 99 00 5 000
004F1A 47 F 0 F 000

```

```

004F1E 0700
004F20 00004000
004F24 00008000
004F28 00010000
004F2C 00018000
004F30 00004001
004F34 00008001
004F38 00010001
004F3C 00018001
004F40 00000020
004F44 00000002
004F48 00004020
004F4C 00008020
004F50 00010020
004F54 00018020
004F58 00004000
004F5C 00006000
004F60 00008000
004F64 0000C000
004F68 00010000
004F6C 00018000
004F70 00020000
004F74 00004021
004F78 00008021
004F7C 00010021
004F80 00018021
004F84 00004001
004F88 00006001
004F8C 00008001
004F90 0000C001
004F94 00010001

```

```

CH 8,CODEAU
BC 8,HAT6
HPR 0(5)
NAT6 HPR 0(5)
RAT6 CLI BABY+1,X'55'
 BC 8,HAT6
 CH 8,CODEAU
 RC 8,EAT6
 HPR 0(5)
EAT6 HPR 0(5)
GAT6 CH 8,CODEAU
 RC 8,PAT6
 HPR 0(5)
PAT6 HPR 0(5)
BAT6 CH 8,CODEAU
 BC 8,HAT6
 HPR 0(5)
 HPR 0(5)
HAT6 HPR 0(5)
TOM BC 15,0(0,15)

```

```

BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 2, BYTE 1 FAILURE
UNIT2, STACK 2, BYTE 0 FAILURE
STACK 1?
YES, THEN JUMP
BYTE 0?
YES, THEN JUMP
UNIT 1, STACK 2, BYTE 1 FAILURE
UNIT 1, STACK 2, BYTE 0 FAILURE
BYTE 0?
YES, THEN JUMP
UNIT 2, STACK 1, BYTE 1 FAILURE
UNIT 2, STACK 1, BYTE 0 FAILURE
BYTE 0?
UNIT 1, STACK 1, BYTE 1 FAILURE
UNIT1, STACK 1, BYTE 0 FAILURE
RETURN TO MAIN RTN

```

```

* THE FOLLOWING ARE ADDRESS CONSTANTS TO DETERMINE BEGINNING *
* AND ENDING ADDRESSES FOR THE TEST ROUTINES *
* FADR/FDR = FIRST OR BEGINNING ADDRESS *
* DAUR = DELTA OR INCREMENTAL ADDRESS *
* LADR/LDR = LAST OR ENDING ADDRESS *
* TADR = TEST ADDRESS USED IN TESTING FOR MEMORY SIZE *

* CONSTANTS ARE ENTERED HERE *

```

```

CNOF 0,4
FADR2 DC XL4'4000'
FADR3 DC XL4'8000'
FADR4 DC XL4'10000'
FADR5 DC XL4'18000'
FADR2A DC XL4'4001'
FADR3A DC XL4'8001'
FADR4A DC XL4'10001'
FADR5A DC XL4'18001'
DADR1 DC XL4'20'
DADR3 DC XL4'0002'
LADR1 DC XL4'4020'
LADR2 DC XL4'8020'
LADR3 DC XL4'10020'
LADR4 DC XL4'18020'
LADR5 DC XL4'4000'
LADR6 DC XL4'6000'
LADR7 DC XL4'8000'
LADR8 DC XL4'C000'
LADR9 DC XL4'10000'
LADR10 DC XL4'18000'
LADR11 DC XL4'20000'
LADR1A DC XL4'4021'
LADR2A DC XL4'8021'
LADR3A DC XL4'10021'
LADR4A DC XL4'18021'
LADR5A DC XL4'4001'
LADR6A DC XL4'6001'
LADR7A DC XL4'8001'
LADR8A DC XL4'C001'
LADR9A DC XL4'10001'

```

|        |          |        |    |            |
|--------|----------|--------|----|------------|
| 004F98 | 00018001 | LDR10A | DC | XL4'18001' |
| 004F9C | 00020001 | LDR11A | DC | XL4'20001' |
| 004FA0 | 00006000 | TADR1  | DC | XL4'6000'  |
| 004FA4 | 00008000 | TADR2  | DC | XL4'8000'  |
| 004FA8 | 0000C000 | TADR3  | DC | XL4'C000'  |
| 004FAC | 00010000 | TADR4  | DC | XL4'10000' |
| 004FB0 | 00018000 | TADR5  | DC | XL4'18000' |
| 004FB4 | 00006134 | TADR1A | DC | XL4'6134'  |
| 004FB8 | 00008134 | TADR2A | DC | XL4'8134'  |
| 004FBC | 0000C134 | TADR3A | DC | XL4'C134'  |
| 004FC0 | 00010134 | TADR4A | DC | XL4'10134' |
| 004FC4 | 00018134 | TADR5A | DC | XL4'18134' |
| 004FCC | 0000A934 | BADR20 | DC | XL4'A934'  |
| 004F08 | 00009208 | BADR21 | DC | XL4'9208'  |
| 004FD0 | 0000980C | BADR22 | DC | XL4'980C'  |
| 004FD4 | 0000C412 | BADR23 | DC | XL4'C412'  |
| 004FD8 | 0000CD16 | BADR24 | DC | XL4'CD16'  |
| 004FDC | 0000D61A | BADR25 | DC | XL4'D61A'  |
| 004FE0 | 0000DF1E | BADR26 | DC | XL4'DF1E'  |
| 004FE4 | 00012934 | BADR41 | DC | XL4'12934' |
| 004FE8 | 00011208 | BADR42 | DC | XL4'11208' |
| 004FEC | 0001180C | BADR43 | DC | XL4'1180C' |
| 004FF0 | 00014412 | BADR44 | DC | XL4'14412' |
| 004FF4 | 00014D16 | BADR45 | DC | XL4'14D16' |
| 004FF8 | 0001561A | BADR46 | DC | XL4'1561A' |
| 004FFC | 00015F1E | BADR47 | DC | XL4'15F1E' |
| 005000 | 0001A934 | BADR51 | DC | XL4'1A934' |
| 005004 | 00019208 | BADR52 | DC | XL4'19208' |
| 005008 | 0001980C | BADR53 | DC | XL4'1980C' |
| 00500C | 0001C412 | BADR54 | DC | XL4'1C412' |
| 005010 | 0001CD16 | BADR55 | DC | XL4'1CD16' |
| 005014 | 0001D61A | BADR56 | DC | XL4'1D61A' |
| 005018 | 0001DF1E | BADR57 | DC | XL4'1DF1E' |
| 00501C | 0000A900 | FDR29  | DC | XL4'A900'  |
| 005020 | 00009200 | FDR30  | DC | XL4'9200'  |
| 005024 | 00009800 | FDR31  | DC | XL4'9800'  |
| 005028 | 0000C400 | FDR32  | DC | XL4'C400'  |
| 00502C | 0000CD00 | FDR33  | DC | XL4'CD00'  |
| 005030 | 0000D600 | FDR34  | DC | XL4'D600'  |
| 005034 | 0000DF00 | FDR35  | DC | XL4'DF00'  |
| 005038 | 00012900 | FDR43  | DC | XL4'12900' |
| 00503C | 00011200 | FDR44  | DC | XL4'11200' |
| 005040 | 00011800 | FDR45  | DC | XL4'11800' |
| 005044 | 00014400 | FDR46  | DC | XL4'14400' |
| 005048 | 00014D00 | FDR47  | DC | XL4'14D00' |
| 00504C | 00015600 | FDR48  | DC | XL4'15600' |
| 005050 | 00015F00 | FDR49  | DC | XL4'15F00' |
| 005054 | 0001A900 | FDR57  | DC | XL4'1A900' |
| 005058 | 00019200 | FDR58  | DC | XL4'19200' |
| 00505C | 00019800 | FDR59  | DC | XL4'19800' |
| 005060 | 0001C400 | FDR60  | DC | XL4'1C400' |
| 005064 | 0001CD00 | FDR61  | DC | XL4'1CD00' |
| 005068 | 0001D600 | FDR62  | DC | XL4'1D600' |
| 00506C | 0001DF00 | FDR63  | DC | XL4'1DF00' |
| 005070 | 0000A920 | LDR29  | DC | XL4'A920'  |
| 005074 | 00009220 | LDR30  | DC | XL4'9220'  |
| 005078 | 00009820 | LDR31  | DC | XL4'9820'  |
| 00507C | 0000C420 | LDR32  | DC | XL4'C420'  |
| 005080 | 0000CD20 | LDR33  | DC | XL4'CD20'  |

|        |                   |        |    |               |                              |
|--------|-------------------|--------|----|---------------|------------------------------|
| 005084 | 00000620          | LDR34  | DC | XL4'D620'     |                              |
| 005088 | 00000F20          | LDR35  | DC | XL4'DF20'     |                              |
| 00508C | 00012920          | LDR43  | DC | XL4'12920'    |                              |
| 005090 | 00011220          | LDR44  | DC | XL4'11220'    |                              |
| 005094 | 00011820          | LDR45  | DC | XL4'11820'    |                              |
| 005098 | 00014420          | LDR46  | DC | XL4'14420'    |                              |
| 00509C | 00014020          | LDR47  | DC | XL4'14020'    |                              |
| 0050A0 | 00015620          | LDR48  | DC | XL4'15620'    |                              |
| 0050A4 | 00015F20          | LDR49  | DC | XL4'15F20'    |                              |
| 0050A8 | 0001A920          | LDR57  | DC | XL4'1A920'    |                              |
| 0050AC | 00019220          | LDR58  | DC | XL4'19220'    |                              |
| 0050B0 | 00019820          | LDR59  | DC | XL4'19820'    |                              |
| 0050B4 | 0001C420          | LDR60  | DC | XL4'1C420'    |                              |
| 0050B8 | 0001C020          | LDR61  | DC | XL4'1C020'    |                              |
| 0050BC | 00010620          | LDR62  | DC | XL4'10620'    |                              |
| 0050C0 | 00010F20          | LDR63  | DC | XL4'10F20'    |                              |
| 0050C4 | 00000000          | PSW    | DC | XL4'00000000' | NEW PSW TO INHIBIT BIN INTER |
| 0050C8 | 00001400          | FADRA  | DC | XL4'1400'     | SUMCHECK, FIRST ADDRESS      |
| 0050CC | 000051AC          | LADRA  | DC | XL4'51AC'     | SUMCHECK, LAST ADDRESS       |
| 0050D0 | 00000004          | DADRA  | DC | XL4'04'       |                              |
| 0050D4 | 38000000          | MASK   | DC | XL4'38000000' | MASK FOR PSW                 |
| 0050D8 | 00000001          | CAW    | DC | XL4'01'       | CAW FOR PRINT OUT            |
| 0050DC | 00020114          | SCW    | DC | XL4'00020114' | SCW FOR PRINT OUT            |
| 0050E0 | 38000000          |        | DC | XL4'38000000' |                              |
| 0050E4 | 30                | MNPSW1 | DC | X'30'         | NEW PSW FOR 24K MEM TEST     |
| 0050E5 | 00450E            |        | DC | AL3(T24K1)    |                              |
| 0050E8 | 01                | BCW1   | DC | X'01'         | BCW FOR 24KTEST              |
| 0050E9 | 0050EC            |        | DC | AL3(BUF24K)   |                              |
| 0050EC | 0025              | BUF24K | DC | X'0025'       | MESSAGE FOR 24K TEST         |
| 0050EE | F0F2F4D2 40D4C5D4 |        | DC | C'024K MEMORY |                              |
| 0050FA | 0025              |        | DC | X'0025'       |                              |
| 0050FC | 30                | MNPSW2 | DC | X'30'         | NEW PSW FOR 32K MEM TEST     |
| 0050FD | 004626            |        | DC | AL3(T32K1)    |                              |
| 005100 | 01                | BCW2   | DC | X'01'         | BCW FOR 32K MEM TEST         |
| 005101 | 005104            |        | DC | AL3(BUF32K)   |                              |
| 005104 | 0025              | BUF32K | DC | X'0025'       | MESSAGE FOR 32K TEST         |
| 005106 | F0F3F2D2 40D4C5D4 |        | DC | C'032K MEMORY |                              |
| 005112 | 0025              |        | DC | X'0025'       |                              |
| 005114 | 30                | MNPSW3 | DC | X'30'         | NEW PSW FOR 48K MEM TEST     |
| 005115 | 00466E            |        | DC | AL3(T48K1)    |                              |
| 005118 | 01                | BCW3   | DC | X'01'         | BCW FOR 48K MEM TEST         |
| 005119 | 00511C            |        | DC | AL3(BUF48K)   |                              |
| 00511C | 0025              | BUF48K | DC | X'0025'       | MESSAGE FOR 48K MEM TEST     |
| 00511E | F0F4F8D2 40D4C5D4 |        | DC | C'048K MEMORY |                              |
| 00512A | 0025              |        | DC | X'0025'       |                              |
| 00512C | 30                | MNPSW4 | DC | X'30'         | NEW PSW FOR 65K MEM TEST     |
| 00512D | 0046F2            |        | DC | AL3(U152)     |                              |
| 005130 | 01                | BCW4   | DC | X'01'         | BCW FOR 65K MEM TEST         |
| 005131 | 005134            |        | DC | AL3(BUF65K)   |                              |
| 005134 | 0025              | BUF65K | DC | X'0025'       | MESSAGE FOR 65K TEST         |
| 005136 | F0F6F5D2 40D4C5D4 |        | DC | C'065K MEMORY |                              |
| 005142 | 0025              |        | DC | X'0025'       |                              |
| 005144 | 30                | MNPSW5 | DC | X'30'         | NEW PSW FOR 98K MEM TEST     |
| 005145 | 004782            |        | DC | AL3(T98K1)    |                              |
| 005148 | 01                | BCW5   | DC | X'01'         | BCW FOR 98K MEM TEST         |
| 005149 | 00514C            |        | DC | AL3(BUF98K)   |                              |
| 00514C | 0025              | BUF98K | DC | X'0025'       | MESSAGE FOR 98K TEST         |
| 00514E | F0F9F8D2 40D4C5D4 |        | DC | C'098K MEMORY |                              |
| 00515A | 0025              |        | DC | X'0025'       |                              |

|        |                   |         |     |                |                                |
|--------|-------------------|---------|-----|----------------|--------------------------------|
| 00515C | 30                | MNPS#6  | DC  | X'30'          | NEA PSW FOR 131K MEM TEST      |
| 00515D | 0047FA            |         | DC  | AL3(T131K1)    |                                |
| 005160 | 01                | MBCW6   | DC  | X'01'          | BCW FOR 131K MEM TEST          |
| 005161 | 005164            |         | DC  | AL3(BUF131K)   |                                |
| 005164 | 0025              | BUF131K | DC  | X'0025'        | MESSAGE FOR 131K TEST          |
| 005166 | F1F3F1D2 40D4C5D4 |         | DC  | C'131K MEMORY' |                                |
| 005172 | 0000              |         |     |                |                                |
| 005174 | 00000000          | CTR     | DC  | F'0'           | ERROR CTR, YDIM TEST           |
| 005178 | 00000000          | XCTR    | DC  | F'0'           | CTR FOR WRITE RTN, YDIM TEST   |
| 00517C | 00000000          | BCTR    | DC  | F'0'           | ERROR CTR, YDIM TEST           |
| 005180 | 000000AE          | TUTADR  | DC  | XL4'00AE'      | ADDRESSES TO BE ADDED IN SUMCK |
| 005184 | 00004300          | BASE1   | DC  | XL4'4300'      | BASE ADDRESS, MOVE RTN         |
| 005188 | 00001300          | BASE2   | DC  | XL4'1300'      | BASE ADDRESS, MOVE RTN         |
| 00518C | 00001000          | BASE3   | DC  | XL4'1000'      | BASE REGISTER CONSTANTS        |
| 005190 | 00002000          |         | DC  | XL4'2000'      | FOR LOW ORDER EXECUTION        |
| 005194 | 00000064          | ACNT    | DC  | XL4'64'        | COUNT OF 100, XDIM TEST        |
| 005198 | FFFFFFFF          | ONS     | DC  | XL4'FFFFFFFF'  | FWD CONTAINING ALL ONES        |
| 00519C | 00000000          | ZEROES  | DC  | XL4'00'        | FWD CONTAINING ALL ONES        |
| 0051A0 | 00000001          | ONE     | DC  | XL4'01'        | COUNT OF ONE                   |
| 0051A4 | 0040              | CODECU  | DC  | XL2'40'        | BYTE 0 CODE, YDIM TEST         |
| 0051A6 | 0041              | CODEC1  | DC  | XL2'41'        | BYTE 1 CODE, YDIM TEST         |
| 0051A8 | 0160              | CODEAL  | DC  | XL2'160'       | BYTE 0 CODE, XDIM TEST         |
| 0051AA | 0161              | CODEA1  | DC  | XL2'161'       | BYTE 1 CODE, XDIM TEST         |
| 0051AC | 0000              | CODEX   | DC  | H'0'           | PRINT BYPASS CODE              |
| 0051AE | 0000              | ACTR    | DC  | H'0'           | ADDRESS JUMP CTR               |
| 0051B0 | 0000              | UNIT    | DC  | H'0'           | CODE FOR UNIT I/O              |
| 0051B2 | 0000              | BABY    | DC  | H'0'           | NOTES IF STK/SIDE INTER DONE   |
| 0051B4 | 0000              | JCTR    | DC  | H'0'           | ADDRESS JUMP CTR, YDIM TEST    |
| 0051B6 | 0000              | RECRD   | DC  | H'0'           | RECORDS END OF MEMORY          |
| 0051B8 | 0000              | COD98   | DC  | H'0'           |                                |
| 0051BA | 0000              | COD131  | DC  | H'0'           |                                |
|        |                   |         | DC  | 0,4            |                                |
| 0051BC | 8D78E032          | SUMCK   | DC  | XL4'8D78E032'  | SUMCHECK CONSTANT              |
|        | 001000            |         | END | SUMR           |                                |



Pages 6-143 through 6-156  
intentionally omitted to  
permit the insertion of  
future program listings.





```

SCOM START 20480
 USING *,R12
 *
 *
 * REGISTER AND SPECIAL CONSTANT EQUATES ARE MADE HERE
 *
 *
000001 B1 EQU 1
000002 B2 EQU 2
000003 B3 EQU 3
000004 B4 EQU 4
000005 B5 EQU 5
000006 B6 EQU 6
000007 B7 EQU 7
000008 B8 EQU 8
000009 B9 EQU 9
00000A B10 EQU 10
00000B B11 EQU 11
00000C B12 EQU 12
00000D B13 EQU 13
00000E B14 EQU 14
00000F B15 EQU 15
 *
000000 R0 EQU 0
000001 R1 EQU 1
000002 R2 EQU 2
000003 R3 EQU 3
000004 R4 EQU 4
000005 R5 EQU 5
000006 R6 EQU 6
000007 R7 EQU 7
000008 R8 EQU 8
000009 R9 EQU 9
00000A R10 EQU 10
00000B R11 EQU 11
00000C R12 EQU 12
00000D R13 EQU 13
00000E R14 EQU 14
00000F R15 EQU 15
 *
000000 S0ABS EQU 0
000010 S1ABS EQU 16
000020 S2ABS EQU 32
000030 S3ABS EQU 48
000040 S4ABS EQU 64
000050 S5ABS EQU 80

```

|           |        |     |        |
|-----------|--------|-----|--------|
| 000060    | S6ABS  | EQU | 96     |
| 000070    | S7ABS  | EQU | 112    |
| 000080    | S8ABS  | EQU | 128    |
| 000090    | S9ABS  | EQU | 144    |
| 0000A0    | S10ABS | EQU | 160    |
| 0000B0    | S11ABS | EQU | 176    |
| 0000C0    | S12ABS | EQU | 192    |
| 0000D0    | S13ABS | EQU | 208    |
| 0000E0    | S14ABS | EQU | 224    |
| 0000F0    | S15ABS | EQU | 240    |
| * * * * * |        |     |        |
| 000008    | OSVPSW | EQU | X'008' |
| 000018    | OPRPSW | EQU | X'018' |
| 000028    | OTMPSW | EQU | X'028' |
| 000038    | OMSPSW | EQU | X'038' |
| 000048    | OMNPSW | EQU | X'048' |
| 000058    | OS1PSW | EQU | X'058' |
| 000068    | OS2PSW | EQU | X'068' |
| 000078    | ONUPSW | EQU | X'078' |
| 000088    | NSVPSW | EQU | X'088' |
| 000098    | NPRPSW | EQU | X'098' |
| 0000A8    | NTMPSW | EQU | X'0A8' |
| 0000B8    | NMSPSW | EQU | X'0B8' |
| 0000C8    | NMNPSW | EQU | X'0C8' |
| 0000D8    | NS1PSW | EQU | X'0D8' |
| 0000E8    | NS2PSW | EQU | X'0E8' |
| 000114    | IPLBCW | EQU | X'114' |
| 000190    | TCW    | EQU | X'190' |
| 0001A0    | CSW1   | EQU | X'1A0' |
| 0001A8    | CSW2   | EQU | X'1A8' |
| * * * * * |        |     |        |

```

005000 18 C 5
005002 80 00 C 020
005006 98 0 3 C 01C
00500A 90 1 2 0 0B8
00500E 50 3 0 0 100
005012 9C 00 0 080
005016 47 F 0 C 016
00501A 0000
00501C 00000001
005020 FF000000
005024 00005044
005028 0002
00502A 502C
00502C 0080
00502E 5030
005030 0D25
005032 C34BC14B
005036 0D25

005038 58 1 0 0 03C
00503C 99 00 1 000
005040 82 00 0 038

```

## EJECT

THE COMMUNICATIONS ADAPTER TEST BEGINS HERE (PRINT C.A.)

```

MPXBEG LR R12,R5 MPX=CHAN CONSOLE MESSAGE
 SSM PSWMES
 LM R0,R3,MES
 STM R1,R2,NMSPSW(0) STORE NEW MPX=SHARED PSW
 ST R3,256(0,0)
 SIO 128(0) START CONSOLE
 BC 15,* UNCONDITIONAL JP

MES DC F'1' WRITE COMMAND
PSWMES DC X'FF000000' MPX=SHARED INTERRUPT ENABLE
 DC A(TRY) PSW ADDRESS
SCWMES DC X'0002' SCW
 DC Y(BCWMES) SCW
BCWMES DC X'0080' BCW (BYTE COUNT)
 DC Y(MESCOM) MESSAGE ADDRESS
MESCOM DC X'0D25' CARRIAGE RETURN
 DC C'C.A.' MESSAGE TO BE DISPLAYED
 DC X'0D25'

*
ERROR1 L R1,0MSPSW+4(,0) UNEXPECTED MPX=SHARED INTERRUPT
 HPR 0(R1) DISPLAY PROGRAM ADDRESS AT INT
 LPSW 0MSPSW(0) RE-ENTER PROGRAM FROM HERE

```

## EJECT

```

* * * * *
*
* THE TEST BEGINS WITH A COMMAND TO SET NON-SHARED CONSOLE MODE
*
TRY LA R0,7(,0) 07 COMMAND = SET CONSOLE NON-SH
 SIO 128(0) ADDRESS
 BC 11,* WAIT FOR CC OF ONE (STATUS STORED)
*
* BEGIN TESTING VIA DATA TURNAROUND LOOP TO CONSOLE
*
CHKFF1 L R2,BCWF1 COMPARE FF TO FF
 XR R4,R4
 MVC NMSPSW(8,0),PSW1 SETUP ERROR STOP IF MPX=SH INT
 L R5,XCPSTA
 L R1,SCWFFF
 BAL R6,NSHS10 BRANCH TO MPX=NS I/O ROUTINE
 L R2,BCWF2 COMPARE FF TO FE
 L R5,NCPSTA
 L R1,SCWFFF
 BAL R6,NSHS10 BRANCH TO MPX=NS I/O ROUTINE
 L R2,BCWF3 COMPARE FF TO FD
 L R5,NCPSTA
 L R1,SCWFFF
 BAL R6,NSHS10 BRANCH TO MPX=NS I/O ROUTINE
 L R2,BCWF4 COMPARE FF TO FB
 L R5,NCPSTA
 L R1,SCWFFF
 BAL R6,NSHS10 BRANCH TO MPX=NS I/O ROUTINE
 L R2,BCWF5 COMPARE FF TO F7
 L R5,NCPSTA
 L R1,SCWFFF
 BAL R6,NSHS10 BRANCH TO MPX=NS I/O ROUTINE
 L R2,BCWF6 LOAD R2 WITH EF
 L R5,NCPSTA
 L R1,SCWFFF
 BAL R6,NSHS10 BRANCH TO MPX=NS I/O ROUTINE
 L R2,BCWF7 LOAD R2 WITH DF
 L R5,NCPSTA
 L R1,SCWFFF
 BAL R6,NSHS10 BRANCH TO MPX=NS I/O ROUTINE
 L R2,BCWF8 LOAD R2 WITH BF
 L R5,NCPSTA

```

```

005044 41 0 0 0 007
005048 9C 00 0 080
00504C 47 8 0 C 04C

005050 58 2 0 C 1D8
005054 17 4 4
005056 02 07 0 0B8 C 19C
00505C 58 5 0 C 1B0
005060 58 1 0 C 220
005064 45 6 0 C 22C
005068 58 2 0 C 1DC
00506C 58 5 0 C 1AC
005070 58 1 0 C 220
005074 45 6 0 C 22C
005078 58 2 0 C 1E0
00507C 58 5 0 C 1AC
005080 58 1 0 C 220
005084 45 6 0 C 22C
005088 58 2 0 C 1E4
00508C 58 5 0 C 1AC
005090 58 1 0 C 220
005094 45 6 0 C 22C
005098 58 2 0 C 1E8
00509C 58 5 0 C 1AC
0050A0 58 1 0 C 220
0050A4 45 6 0 C 22C
0050A8 58 2 0 C 1EC
0050AC 58 5 0 C 1AC
0050B0 58 1 0 C 220
0050B4 45 6 0 C 22C
0050B8 58 2 0 C 1F0
0050BC 58 5 0 C 1AC
0050C0 58 1 0 C 220
0050C4 45 6 0 C 22C
0050C8 58 2 0 C 1F4
0050CC 58 5 0 C 1AC

```

|        |              |        |     |           |                              |
|--------|--------------|--------|-----|-----------|------------------------------|
| 005000 | 58 1 0 C 220 |        | L   | R1,SCWFFF |                              |
| 005004 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005008 | 58 2 0 C 1F8 | CHKFF9 | L   | R2,BCWF9  | LOAD R2 WITH 7F              |
| 00500C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 0050E0 | 58 1 0 C 220 |        | L   | R1,SCWFFF |                              |
| 0050E4 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 0050E8 | 58 2 0 C 1FC | CHKF10 | L   | R2,BCWF10 | LOAD R2 WITH 00              |
| 0050EC | 58 5 0 C 180 |        | L   | R5,XCPSTA |                              |
| 0050F0 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 0050F4 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 0050F8 | 58 2 0 C 200 | CHKF11 | L   | R2,BCWF11 | LOAD R2 WITH 01              |
| 0050FC | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005100 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005104 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005108 | 58 2 0 C 204 | CHKF12 | L   | R2,BCWF12 | LOAD R2 WITH 02              |
| 00510C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005110 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005114 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005118 | 58 2 0 C 208 | CHKF13 | L   | R2,BCWF13 | LOAD R2 WITH 04              |
| 00511C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005120 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005124 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005128 | 58 2 0 C 20C | CHKF14 | L   | R2,BCWF14 | LOAD R2 WITH 08              |
| 00512C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005130 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005134 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005138 | 58 2 0 C 210 | CHKF15 | L   | R2,BCWF15 | LOAD R2 WITH 10              |
| 00513C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005140 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005144 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005148 | 58 2 0 C 214 | CHKF16 | L   | R2,BCWF16 | LOAD R2 WITH 20              |
| 00514C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005150 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005154 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005158 | 58 2 0 C 218 | CHKF17 | L   | R2,BCWF17 | LOAD R2 WITH 40              |
| 00515C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005160 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005164 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005168 | 58 2 0 C 21C | CHKF18 | L   | R2,BCWF18 | LOAD R2 WITH 80              |
| 00516C | 58 5 0 C 1AC |        | L   | R5,NCPSTA |                              |
| 005170 | 58 1 0 C 224 |        | L   | R1,ZERSCW |                              |
| 005174 | 45 6 0 C 22C |        | BAL | R6,NSHS10 | BRANCH TO MPX=NS I/O ROUTINE |
| 005178 | 41 0 0 0 00B | XIT    | LA  | R0,11(,0) | 0B COMMAND SETS SHARED MODE  |
| 00517C | 9C 00 0 080  |        | S10 | 128(0)    |                              |

005180 47 B 0 C 180  
005184 47 F 0 0 214

BC 11,\*  
BC 15,X'214'(:,0)

BRANCH TO PRELUDE LOADERS

005188 00000000  
00000000

\*  
TABLE

DC 2F'0'

STSTATUS TABLE

005190 00000FFF

CONS1

DC X'00000FFF'

CONSTANT TO GET DISPLACEMENT

005194 00000002

CONS2

DC X'00000002'

CONSTANT TO GET BASE REGISTER

005198 00100000

WC

DC X'00100000'

ARBITRARY WAIT COUNT

00519C 00000000

PSW1

DC F'0'

NEW MPX-SH PSW

0051A0 00005038

DC A(ERROR1)

NEW MPX-SH PSW

0051A4 000052D8

XSCW

DC A(STBCW2)

SCW STATUS TABLE

0051A8 FF00

XBCW

DC X'FF00'

EXPECTED STATUS TABLE BCW

0051AA 518C

DC Y(TABLE+4)

EXPECTED STATUS TABLE BCW

0051AC 000051B4

NCPSTA

DC A(STATNC)

0051B0 000051BC

XCPSTA

DC A(STATCP)

0051B4 00000C00

STATNC

DC X'00000C00'

0051B8 00000000

DC F'0'

0051BC 00000040

STATCP

DC X'00000040'

0051C0 00000C00

DC X'00000C00'

0051C4 FF

BYTEF1

DC X'FF'

0051C5 FE

BYTEF2

DC X'FE'

0051C6 FD

BYTEF3

DC X'FD'

0051C7 FB

BYTEF4

DC X'FB'

0051C8 F7

BYTEF5

DC X'F7'

0051C9 EF

BYTEF6

DC X'EF'

0051CA DF

BYTEF7

DC X'DF'

0051CB BF

BYTEF8

DC X'BF'

0051CC 7F

BYTEF9

DC X'7F'

0051CD 00

BYTE10

DC X'00'

0051CE 01

BYTE11

DC X'01'

0051CF 02

BYTE12

DC X'02'

0051D0 04

BYTE13

DC X'04'

0051D1 08

BYTE14

DC X'08'

0051D2 10

BYTE15

DC X'10'

0051D3 20

BYTE16

DC X'20'

0051D4 40

BYTE17

DC X'40'

0051D5 80

BYTE18

DC X'80'

0051D6 0700

DC 0,4

0051D8 0010

BCWF1

DC X'0010'

0051DA 51C4

DC Y(BYTEF1)

0051DC 0010

BCWF2

DC X'0010'

0051DE 51C5

DC Y(BYTEF2)

0051E0 0010

BCWF3

DC X'0010'

0051E2 51C6

DC Y(BYTEF3)

|        |          |        |      |             |                |
|--------|----------|--------|------|-------------|----------------|
| 0051E4 | 0010     | BCWF4  | DC   | X'0010'     |                |
| 0051E6 | 51C7     |        | DC   | Y(BYTEF4)   |                |
| 0051E8 | 0010     | BCWF5  | DC   | X'0010'     |                |
| 0051EA | 51C8     |        | DC   | Y(BYTEF5)   |                |
| 0051EC | 0010     | BCWF6  | DC   | X'0010'     |                |
| 0051EE | 51C9     |        | DC   | Y(BYTEF6)   |                |
| 0051F0 | 0010     | BCWF7  | DC   | X'0010'     |                |
| 0051F2 | 51CA     |        | DC   | Y(BYTEF7)   |                |
| 0051F4 | 0010     | BCWF8  | DC   | X'0010'     |                |
| 0051F6 | 51CB     |        | DC   | Y(BYTEF8)   |                |
| 0051F8 | 0010     | BCWF9  | DC   | X'0010'     |                |
| 0051FA | 51CC     |        | DC   | Y(BYTEF9)   |                |
| 0051FC | 0010     | BCWF10 | DC   | X'0010'     |                |
| 0051FE | 51CD     |        | DC   | Y(BYTE10)   |                |
| 005200 | 0010     | BCWF11 | DC   | X'0010'     |                |
| 005202 | 51CE     |        | DC   | Y(BYTE11)   |                |
| 005204 | 0010     | BCWF12 | DC   | X'0010'     |                |
| 005206 | 51CF     |        | DC   | Y(BYTE12)   |                |
| 005208 | 0010     | BCWF13 | DC   | X'0010'     |                |
| 00520A | 51D0     |        | DC   | Y(BYTE13)   |                |
| 00520C | 0010     | BCWF14 | DC   | X'0010'     |                |
| 00520E | 51D1     |        | DC   | Y(BYTE14)   |                |
| 005210 | 0010     | BCWF15 | DC   | X'0010'     |                |
| 005212 | 51D2     |        | DC   | Y(BYTE15)   |                |
| 005214 | 0010     | BCWF16 | DC   | X'0010'     |                |
| 005216 | 51D3     |        | DC   | Y(BYTE16)   |                |
| 005218 | 0010     | BCWF17 | DC   | X'0010'     |                |
| 00521A | 51D4     |        | DC   | Y(BYTE17)   |                |
| 00521C | 0010     | BCWF18 | DC   | X'0010'     |                |
| 00521E | 51D5     |        | DC   | Y(BYTE18)   |                |
|        |          |        | CNOP | 0,4         |                |
| 005220 | FF0A0114 | SCWFFF | DC   | X'FF0A0114' | NON SHARED SCW |
| 005224 | 000A0114 | ZERSCW | DC   | X'000A0114' |                |
| 005228 | 00000001 | COMAND | DC   | X'00000001' | WRITE COMMAND  |

## EJECT

## MULTIPLEX CHANNEL NON-SHARED I/O SUBROUTINE :

ENTER WITH R0 = CONSOLE COMMAND

R1 = CONSOLE SCW (FLAGS, BCW ADDRESS)

R2 = CONSOLE BCW (BYTE COUNT DATA ADDRESS)

R3 = ADDRESS TO GO TO IF NO INTERRUPT OCCURS

R4 = ADDRESS TO GO TO IF AN INTERRUPT OCCURS

NOTE IF R4 IS ZERO AN INTERRUPT GOES TO NSHINT.

|        |                   |        |     |                     |                                        |
|--------|-------------------|--------|-----|---------------------|----------------------------------------|
| 00522C | 90 0 3 C 2C8      | NSHSIO | STM | R0,R3,NSHBUF        | SAVE REGISTERS AT ENTRY.               |
| 005230 | 50 1 0 0 200      |        | ST  | R1,512(,0)          | X=200= IS NON-SHARED SCW               |
| 005234 | 50 2 0 0 114      |        | ST  | R2,276(,0)          | X=114= IS NON-SHARED BCW               |
| 005238 | 02 07 0 0C8 C 2E4 |        | MVC | NMNP SW(8,0),NSHPSW | R0 IS CONSOLE COMMAND                  |
| 00523E | 41 3 0 C 2D8      |        | LA  | R3,STBCW2           | GET STATUS TABLE BCW ADDRESS           |
| 005242 | 50 3 0 0 180      |        | ST  | R3,X'180'(,0)       | STORE THE BCW ADDRESS IN SCW           |
| 005246 | 02 03 C 2D8 C 2E0 |        | MVC | STBCW2(4),STBCW     | MOVE CORRECT VALUES INTO BCW           |
| 00524C | 02 07 C 188 C 2EC |        | MVC | TABLE(8),ALL00      | CLEAR THE STATUS TABLE TO ZERO         |
| 005252 | 98 0 3 C 2C8      |        | LM  | R0,R3,NSHBUF        | RESTORE R0-R3 TO ORIGINAL VALUE        |
| 005256 | 80 00 C 2E4       |        | SSM | NSHPSW              | ALLOW I/O INTERRUPTS NOW               |
| 00525A | 41 0 0 0 00F      |        | LA  | R0,15(,0)           |                                        |
| 00525E | 9C 00 0 080       |        | SIO | X'80'(0)            | START I/O ON CONSOLE, CHANNEL 03       |
| 005262 | 50 1 0 C 2C0      |        | ST  | R1,NTEMP            | SAVE R1 FOR LATER CHECKS               |
| 005266 | 58 1 0 C 198      |        | L   | R1,WC               | GET A COUNT TO DECREMENT (WAIT)        |
| 00526A | 46 1 0 C 26A      |        | BCT | R1,0                | TEST FOR ZERO, (NOT=COUNT DOWN)        |
| 00526E | 99 00 6 000       |        | HPR | 0(R6)               | • NO INTERRUPT OCCURRED; SHOW CALL ADR |
| 005272 | 47 8 0 C 27A      | NSHINT | BC  | 8,NSHSCW            | CONDITION CODE SHOULD BE 0             |
| 005276 | 99 00 6 000       |        | HPR | 0(R6)               | • CC NOT ZERO AFTER A SIO INST         |
| 00527A | 05 03 0 180 C 1A4 | NSHSCW | CLC | 384(4,0),XSCW       | 180 HEX=NON-SHARED SCW ADDR.           |
| 005280 | 47 8 0 C 288      |        | BC  | 8,NEXT              | EQUAL?                                 |
| 005284 | 99 00 6 000       |        | HPR | 0(R6)               | • NOT EQUAL, HALT                      |
| 005288 | 59 5 0 C 180      | NEXT   | C   | R5,XCPSTA           | BEGIN STA TBL BCW CHECKS               |
| 00528C | 47 8 0 C 2AC      |        | BC  | 8,XCPBCW            | BRANCH = BCW/COMPARE STATUS            |
| 005290 | 05 03 C 2D8 C 1A8 |        | CLC | STBCW2(4),XBCW      | COMPARE NO=FOUND BCW/XPTD VALUE        |
| 005296 | 47 8 0 C 29E      |        | BC  | 8,LAB               | EQUAL                                  |
| 00529A | 99 00 6 000       |        | HPR | 0(R6)               | • NOT EQUAL                            |
| 00529E | 05 07 5 000 C 188 | LAB    | CLC | 0(8,R5),TABLE       |                                        |
| 0052A4 | 07 8 6            |        | BCR | 8,R6                | BRANCH TO R6                           |
| 0052A6 | 99 00 6 000       |        | HPR | 0(R6)               | • UNEXPECTED STATUS IN TABLE           |
| 0052AA | 07 F 6            |        | BCR | 15,R6               | UNCONDITIONAL BR TO REG                |
| 0052AC | 05 03 C 2D8 C 2C4 | XCPBCW | CLC | STBCW2(4),CPBCW     | COMPARE BCW TO XPTD (FOUND) BCW        |



|        |              |        |     |             |                                   |
|--------|--------------|--------|-----|-------------|-----------------------------------|
| 0052B2 | 47 8 0 C 29E |        | BC  | 8,LAB       | BRANCH IF EQUAL (ALL OK)          |
| 0052B6 | 99 00 6 000  |        | HPR | 0(R6)       | BAD TABLE BCW/FIND=CASE           |
| 0052BA | 47 F 0 C 29E |        | BC  | 15,LAB      | BRANCH TO STATUS CODE CHECKS      |
| 0052BE | 0000         |        |     |             |                                   |
| 0052C0 | 00000000     | NTEMP  | DC  | F'0'        | TEMP STORAGE FOR NON-SHARED TSY   |
| 0052C4 | FF90         | CPBCW  | DC  | X'FF90'     | EXPECTED STATUS TABLE BCW/COMPARE |
| 0052C6 | 5190         |        | DC  | Y(TABLE+8)  | ADDRESS: 2 STATUS TABLE ENTRIES   |
| 0052C8 | 00000000     | NSHBUF | DC  | 4F'0'       | STORAGE FOR RD/R1/R2/R3 NSHSIO    |
|        | 00000000     |        |     |             |                                   |
|        | 00000000     |        |     |             |                                   |
|        | 00000000     |        |     |             |                                   |
| 0052D8 | 00000000     | STBCW2 | DC  | 2F'0'       | LOCATION OF STA BCW               |
|        | 00000000     |        |     |             |                                   |
| 0052E0 | 0010         | STBCW  | DC  | X'0010'     | VALUE FOR STATUS BCW              |
| 0052E2 | 5188         |        | DC  | Y(TABLE)    | (USED TO SET IT UP)               |
| 0052E4 | FF000000     | NSHPSW | DC  | X'FF000000' | PSW FOR NON-SHARED I/O            |
| 0052E8 | 00005272     |        | DC  | A(NSHINT)   | ADDRESS FOR NON-SHARED INTERRUPT  |
| 0052EC | 00000000     | ALL00  | DC  | 2F'0'       | CONSTANT: DOUBLE WORD OF 00       |
|        | 00000000     |        |     |             |                                   |
|        |              |        | END |             |                                   |



SUMMARY START 20480 . . . . . START ADDRESS 50000  
 USING 12

|        |     |     |    |
|--------|-----|-----|----|
| 000001 | B1  | EQU | 1  |
| 000002 | B2  | EQU | 2  |
| 000003 | B3  | EQU | 3  |
| 000004 | B4  | EQU | 4  |
| 000005 | B5  | EQU | 5  |
| 000006 | B6  | EQU | 6  |
| 000007 | B7  | EQU | 7  |
| 000008 | B8  | EQU | 8  |
| 000009 | B9  | EQU | 9  |
| 00000A | B10 | EQU | 10 |
| 00000B | B11 | EQU | 11 |
| 00000C | B12 | EQU | 12 |
| 00000D | B13 | EQU | 13 |
| 00000E | B14 | EQU | 14 |
| 00000F | B15 | EQU | 15 |

|        |     |     |    |
|--------|-----|-----|----|
| 000000 | R0  | EQU | 0  |
| 000001 | R1  | EQU | 1  |
| 000002 | R2  | EQU | 2  |
| 000003 | R3  | EQU | 3  |
| 000004 | R4  | EQU | 4  |
| 000005 | R5  | EQU | 5  |
| 000006 | R6  | EQU | 6  |
| 000007 | R7  | EQU | 7  |
| 000008 | R8  | EQU | 8  |
| 000009 | R9  | EQU | 9  |
| 00000A | R10 | EQU | 10 |
| 00000B | R11 | EQU | 11 |
| 00000C | R12 | EQU | 12 |
| 00000D | R13 | EQU | 13 |
| 00000E | R14 | EQU | 14 |
| 00000F | R15 | EQU | 15 |

|        |        |     |        |
|--------|--------|-----|--------|
| 000000 | S0ABS  | EQU | 0      |
| 000010 | S1ABS  | EQU | 16     |
| 000020 | S2ABS  | EQU | 32     |
| 000030 | S3ABS  | EQU | 48     |
| 000040 | S4ABS  | EQU | 64     |
| 000050 | S5ABS  | EQU | 80     |
| 000060 | S6ABS  | EQU | 96     |
| 000070 | S7ABS  | EQU | 112    |
| 000080 | S8ABS  | EQU | 128    |
| 000090 | S9ABS  | EQU | 144    |
| 0000A0 | S10ABS | EQU | 160    |
| 0000B0 | S11ABS | EQU | 176    |
| 0000C0 | S12ABS | EQU | 192    |
| 0000D0 | S13ABS | EQU | 208    |
| 0000E0 | S14ABS | EQU | 224    |
| 0000F0 | S15ABS | EQU | 240    |
|        |        |     |        |
| 000008 | OSVPSW | EQU | X'008' |
| 000018 | OPRPSW | EQU | X'018' |
| 000028 | OTMPSW | EQU | X'028' |
| 000038 | OMSPSW | EQU | X'038' |
| 000048 | OMNPSW | EQU | X'048' |
| 000058 | OS1PSW | EQU | X'058' |
| 000068 | OS2PSW | EQU | X'068' |
| 000078 | ONUPSW | EQU | X'078' |
| 000088 | NSVPSW | EQU | X'088' |
| 000098 | NPRPSW | EQU | X'098' |
| 0000A8 | NTMPSW | EQU | X'0A8' |
| 0000B8 | NMSPSW | EQU | X'0B8' |
| 0000C8 | NMNPSW | EQU | X'0C8' |
| 0000D8 | NS1PSW | EQU | X'0D8' |
| 0000E8 | NS2PSW | EQU | X'0E8' |
| 000114 | IPLBCW | EQU | X'114' |
| 000190 | TCW    | EQU | X'190' |
| 0001A0 | CSW1   | EQU | X'1A0' |
| 0001A8 | CSW2   | EQU | X'1A8' |
|        |        |     |        |
| 000008 | ZERO   | EQU | 8      |
| 000007 | NONZ   | EQU | 7      |
| 000004 | LSZ    | EQU | 4      |
| 00000C | LEZ    | EQU | 12     |
| 000002 | GTZ    | EQU | 2      |
| 00000A | GEZ    | EQU | 10     |

|        |              |        |      |                   |                                 |
|--------|--------------|--------|------|-------------------|---------------------------------|
|        | 000008       | EQL    | EQU  | 8                 |                                 |
|        | 000007       | NEQ    | EQU  | 7                 |                                 |
|        | 00000F       | UNCOND | EQU  | 15                |                                 |
|        | 000004       | MIXED  | EQU  | 4                 |                                 |
|        | 000001       | ONES   | EQU  | 1                 |                                 |
|        | 00000E       | NONES  | EQU  | 14                |                                 |
|        | 000214       | EXIT   | EQU  | 532               |                                 |
|        | 000001       | PROBLM | EQU  | 1                 |                                 |
| 005000 | 18 C 5       | LLRTST | LR   | R12,R5            | EXIT ADDRESS IN LOADER          |
| 005002 | 17 F F       |        | XR   | R15,R15           | CONSTANT FOR SV=REG/PROB STATE  |
| 005004 | 98 1 2 C 470 |        | LM   | R1,R2,SVCNEW      | GET BASE REGISTER = 1000        |
| 005008 | 90 1 2 0 088 |        | STM  | R1,R2,NSVPSW(0)   | CLEAR R15 FOR FUTURE USE        |
| 00500C | 80 00 C 3F8  |        | SSM  | MSGPSW            | GET NEW SVC PSW                 |
| 005010 | 98 0 3 C 3F4 |        | LM   | R0,R3,MSG         | STORE SVC PSW                   |
| 005014 | 90 1 2 0 088 |        | STM  | R1,R2,NMSPSW(0)   | ALLOW MPX=SH INTERRUPTS         |
| 005018 | 50 3 0 0 100 |        | ST   | R3,256(,0)        | PICKUP CAW/BCW/SCW FOR MESSAGE  |
| 00501C | 9C 00 0 080  |        | SIO  | 128(0)            | STORE NEW MPX =SH PSW           |
| 005020 | 47 F 0 C 020 |        | BC   | 15,0              | STORE SCW FOR CONSOLE MESSAGE   |
| 005024 | 00000000     |        | DC   | F'0'              | PRINT (CONSOLE) ; L.R.          |
| 005028 | 12 1 1       | SVCTMP | LTR  | R1,R1             | WAIT FOR INTERRUPT              |
| 00502A | 50 1 0 C 024 | SUPER  | ST   | R1,SVCTMP         | STORAGE FOR SVC ROUTINE USE     |
| 00502E | 47 8 0 C 036 |        | BC   | 8,MASKN           | SUPERVISOR CALL ROUTINE         |
| 005032 | 40 1 0 0 09E |        | STH  | R1,NPRPSW+6(,0)   | SAVE INCOMING VALUE OF R1       |
| 005036 | 58 1 0 0 008 | MASKN  | L    | R1,OSVPSW(,0)     | BRANCH IF NO NEW=PROGRAM PSW    |
| 00503A | 54 1 0 C 46C |        | N    | R1,INCMASK        | STORE NEW=PROGRAM PSW ADDRESS   |
| 00503E | 89 2 0 0 008 |        | SLL  | R2,8(0)           | GET INTERRUPT CODE (R1/R2:SVC)  |
| 005042 | 16 1 2       |        | OR   | R1,R2             | AND=OUT ALL ELSE                |
| 005044 | 40 1 0 C 460 |        | STH  | R1,SVCPSP         | MOVE SYSTEM=MASK BITS INTO POS. |
| 005048 | 58 1 0 0 00C |        | L    | R1,OSVPSW+4(,0)   | OR=IN SYSTEM MASK               |
| 00504C | 54 1 0 C 468 |        | N    | R1,ADRMASK        | STORE IN NEW EXIT PSW           |
| 005050 | 40 1 0 C 466 |        | STH  | R1,SVCPSP+6       | GET SVC CALL ADDRESS +2         |
| 005054 | 58 1 0 C 024 |        | L    | R1,SVCTMP         | AND=OUT ALL ELSE                |
| 005058 | 82 00 C 460  |        | LPSW | SVCPSP            | STORE IN EXIT=PSW               |
| 00505C | 17 F F       | CODESS | XR   | R15,R15           | RESTORE R1 TO ORIGINAL VALUE    |
| 00505E | 91 BF 0 01B  | TMX01  | TM   | OPRPSW+3(0),X'BF' | EXIT                            |
| 005062 | 47 8 0 C 06E |        | BC   | 8,TMX02           | CLEAR OUT DISPLAY REGISTER      |
| 005066 | 43 F 0 0 01B |        | IC   | R15,OPRPSW+3(,0)  | IS ANY CODE BUT W=P INT IN PSW? |
| 00506A | 99 00 F 000  |        | HPR  | 0(R15)            | BRANCH IF NO OTHER CODE.        |
| 00506E | 91 40 0 01B  | TMX02  | TM   | OPRPSW+3(0),X'40' | GET IMPROPER INTERRUPT CODE/PSW |
| 005072 | 47 1 0 B 000 |        | BC   | 1,0(,B11)         | • DISPLAY ERRING INT CODE       |
| 005076 | 43 F 0 0 01B |        | IC   | R15,OPRPSW+3(,0)  | IS WRITE=PROTECT INT CODE IN ?  |
| 00507A | 99 00 F 000  |        | HPR  | 0(R15)            | EXIT IF INTERRUPT CODE ALL OK   |
| 00507E | 47 F 0 B 000 |        | BC   | 15,0(,B11)        | GET IMPROPER INTERRUPT CODE/PSW |
| 005082 | 17 1 1       | INTRPT | XR   | R1,R1             | • DISPLAY ERRING INT CODE       |
|        |              |        |      |                   | EXIT FROM INT CODE CHECK        |
|        |              |        |      |                   | CLEAR PSW=SWAP ADR              |

|        |              |        |     |                 |                                 |
|--------|--------------|--------|-----|-----------------|---------------------------------|
| 005084 | 17 2 2       |        | XR  | R2,R2           | DISABLE ALL INTERRUPTS          |
| 005086 | 0A 00        |        | SVC | 0               | SUPERVISOR STATE FOR SETUP      |
| 005088 | 98 5 6 3 000 |        | LM  | R5,R6,0(R3)     | PICKUP INSTRUCTION TO CHECK     |
| 00508C | 40 7 0 0 09E |        | STH | R7,NPRPSW+6(,0) | STORE INTERRUPT-RETURN ADDRESS  |
| 005090 | 88 6 0 0 010 |        | SRL | R6,16(0)        | IF SS, LAST 2 BYTES TO LOW END  |
| 005094 | 41 1 0 C 344 |        | LA  | R1,SSINST       | GET ADDRESS OF INTERRUPT HALT   |
| 005098 | 50 5 0 A 000 |        | ST  | R5,0(,R10)      | STORE 4-BYTES OF INSTRUCTION    |
| 00509C | 19 3 1       |        | CR  | R3,R1           | IS THIS INSTRUCTION = SS ?      |
| 00509E | 41 3 0 3 004 |        | LA  | R3,4(,R3)       | INCREMENT INSTRUCTION POINTER   |
| 0050A2 | 47 4 0 C 0AE |        | BC  | 4,MASK          | BRANCH IF NOT AN SS INSTRUCTION |
| 0050A6 | 40 6 0 A 004 |        | STH | R6,4(,R10)      | STORE LAST 2 BYTES OF INSTRN.   |
| 0050AA | 41 3 0 3 004 |        | LA  | R3,4(,R3)       | INCREMENT INSTRUCTION POINTER   |
| 0050AE | 80 00 8 000  | MASK   | SSM | 0(R8)           | ALLOW INTERRUPTS FROM LIMITS    |
| 0050B2 | 17 1 1       |        | XR  | R1,R1           | CLEAR R1=PSW SWAP ADR           |
| 0050B4 | 58 2 0 C 478 |        | L   | R2,WPSPR        | ENABLE W-P,PRGM INTERRUPTS      |
| 0050B8 | 0A 01        |        | SVC | PROBLM          | SET PROBLEM STATE FOR EXIT      |
| 0050BA | 47 F 0 A 000 |        | BC  | 15,0(,R10)      | EXIT TO INSTRUCTION EXECUTION   |
| 0050BE | 0000         |        |     |                 |                                 |
| 0050C0 | 00000002     | CONEQ2 | DC  | F'2'            | ALIGN ON A FULL-WORD BOUNDARY   |
| 0050C4 | FFF00000     | FFFF   | DC  | X'FFFF0000'     | CONSTANT FOR W-P GENERAL USE    |
| 0050C8 | 00000000     | TEMP   | DC  | F'0'            | WORKING STORAGE AREA            |
| 0050CC | 17 1 1       | LRLOOP | XR  | R1,R1           | LOOP ENTRY: KEEP PSW-SWAP ADR   |
| 0050CE | 17 2 2       | LRBITS | XR  | R2,R2           | DISABLE ALL INTERRUPTS          |
| 0050D0 | 0A 00        |        | SVC | 0               | SET SUPERVISOR STATE            |
| 0050D2 | 43 7 0 4 000 |        | IC  | R7,0(,R4)       | PICKUP UPPER BOUND              |
| 0050D6 | 89 7 0 0 009 |        | SLL | R7,9(0)         | MOVE INTO ADDRESS POSITION      |
| 0050DA | 17 1 1       |        | XR  | R1,R1           | KEEP SAME PSW SWAP ADR          |
| 0050DC | 58 2 0 C 478 |        | L   | R2,WPSPR        | ENABLE W-P/PROGRAM INTERRUPTS   |
| 0050E0 | 81 00 4 000  |        | LLR | 0(R4)           | *** LOAD LIMITS REG (CK BITS)   |
| 0050E4 | 41 4 0 4 002 |        | LA  | R4,2(,R4)       | INCREMENT BOUNDS POINTER        |
| 0050E8 | 0A 01        |        | SVC | PROBLM          | SET PROBLEM STATE               |
| 0050EA | 40 1 0 7 000 |        | STH | R1,0(,R7)       | TRY STORE WITHIN LIMITS: CK BIT |
| 0050EE | 46 8 0 C 0CC | LRSWAP | BCT | R8,LRLOOP       | FINISH ALL CHECKS IN TABLE      |
| 0050F2 | 47 F 0 A 000 |        | BC  | 15,0(,R10)      | ALL DONE..EXIT FROM SUBROUTINE  |
| 0050F6 | 17 1 1       | BITX03 | XR  | R1,R1           | CLEAR PSW-SWAP ADDRESS          |
| 0050F8 | 17 2 2       | LRBITS | XR  | R2,R2           | CLEAR INTRPT ENABLE BITS        |
| 0050FA | 0A 00        |        | SVC | 0               | SUPERVISOR STATE NOW            |
| 0050FC | 43 7 0 4 000 |        | IC  | R7,0(,R4)       | PICKUP 8-BITS OF ADR TO STORE   |
| 005100 | 89 7 0 0 009 |        | SLL | R7,9(0)         | SHIFT INTO LIMITS POSITION      |
| 005104 | 17 1 1       |        | XR  | R1,R1           | CLEAR PSW-SWAP ADR              |
| 005106 | 58 2 0 C 478 |        | L   | R2,WPSPR        | ENABLE W-P/PROGRAM INTERRUPTS   |
| 00510A | 81 00 5 000  |        | LLR | 0(R5)           | LOAD LIMITS REGISTER/PATTERN    |
| 00510E | 41 5 0 5 002 |        | LA  | R5,2(,R5)       | INCREMENT PATTERN INDEX         |
| 005112 | 0A 01        |        | SVC | PROBLM          | SET PROBLEM STATE NOW           |

|        |              |       |                   |                                 |
|--------|--------------|-------|-------------------|---------------------------------|
| 005114 | 40 1 0 7 000 | STH   | R1,0(,R7)         | TRY STORE-SHOULD INTERRUPT      |
| 005118 | 0A 00        | SVC   | 0                 | NO INTERRUPT                    |
| 00511A | 5B 5 0 C 0C0 | S     | R5,CONEQ2         | REMOVE BIAS FROM PATTERN INDEX  |
| 00511E | 48 F 0 5 000 | LH    | R15,0(,R5)        | PICKUP PATTERN UNDER TEST       |
| 005122 | 99 00 F 000  | HPR   | 0(R15)            | DISPLAY ERRING PATTERN; BAD BIT |
| 005126 | 5A 5 0 C 0C0 | A     | R5,CONEQ2         | RESTORE BIAS TO PATTERN INDEX   |
| 00512A | 46 8 0 C 0F6 | BCT   | R8,BITX03         | TRY NEXT PATTERN                |
| 00512E | 18 4 5       | LR    | R4,R5             | GENERATE STORE ADR/PATTERN      |
| 005130 | 45 8 0 C 05C | BAL   | B11,CODESS        | CHECK INTERRUPT CODE=W-P INT    |
| 005134 | 46 8 0 C 0F6 | BCT   | R8,BITX03         | COMPLETE PATTERN CHECK          |
| 005138 | 07 F A       | BCR   | 15,R10            | EXIT FROM THIS PASS/BIT CHECK   |
| 00513A | 98 1 2 C 470 | LRBGN | R1,R2,SVCNEW      | PICKUP NEW SVC PSW              |
| 00513E | 90 1 2 0 088 | STM   | R1,R2,NSVPSW(0)   | STORE IN NEW SVC PSW            |
| 005142 | 41 1 0 C 162 | LA    | R1,LRHI0K         | INTERRUPT RETURN ADDRESS        |
| 005146 | 58 2 0 C 478 | L     | R2,WSPR           | ENABLE WRITE PROTECT/PROG INT   |
| 00514A | 81 00 C 480  | LLR   | 0F00              | **** LIMITS = 0F 00 NOW ****    |
| 00514E | 47 4 0 C 312 | BC    | 4,NOSLLR          | BRANCH IF LIMITS NOT INSTALLED  |
| 005152 | 0A 01        | SVC   | PROBLM            | SET PROBLM STATE=W-P/PROG INT   |
| 005154 | 48 1 0 C 3D4 | LH    | R1,FFFFZZ         | LARGE CONSTANT ABOVE LIMITS     |
| 005158 | 50 2 0 1 000 | ST    | R2,0(,R1)         | TRY FOR FIRST W-P INTERRUPT     |
| 00515C | 0A 00        | SVC   | 0                 | GET SUPERVISOR STATE (NO INT)   |
| 00515E | 99 00 C 15E  | HPR   |                   | * NO WRITE-PROTECT INTERRUPT    |
| 005162 | 1B 2 2       | SR    | R2,R2             | DONT ENABLE INTERRUPTS          |
| 005164 | 0A 00        | SVC   | 0                 | SUPERVISOR STATE / DISABLE INT  |
| 005166 | 45 8 0 C 05C | BAL   | B11,CODESS        | CHECK INTERRUPT CODE NOW        |
| 00516A | 81 00 C 0C4  | LLR   | FFFO              | **** LIMITS = FF F0 NOW ****    |
| 00516E | 41 1 0 C 182 | LA    | R1,LRLOOK         | PSW SWAP ADDRESS (INTERRUPT)    |
| 005172 | 58 2 0 C 478 | L     | R2,WSPR           | EN WRITE PROTECT/PROG INT       |
| 005176 | 0A 01        | SVC   | PROBLM            | PROBLEM STATE=W-P, PROGRAM INT  |
| 005178 | 50 1 0 C 0C8 | ST    | R1,TEMP           | TRY WRITE BELOW LOWER BOUND     |
| 00517C | 0A 00        | SVC   | 0                 | NO INTERRUPT; GET SUPV STATE    |
| 00517E | 99 00 C 17E  | HPR   |                   | * NO WRITE PROTECT INTERRUPT    |
| 005182 | 1B 2 2       | SR    | R2,R2             | DISABLE ALL INTERRUPTS          |
| 005184 | 0A 00        | SVC   | 0                 | SET SUPERVISOR STATE, NO INT    |
| 005186 | 45 8 0 C 05C | BAL   | B11,CODESS        | VERIFY INTERRUPT CODE           |
| 00518A | 41 1 0 C 19E | LA    | R1,PRIVOK         | PSW SWAP ADR IF PRIV=INST INT   |
| 00518E | 58 2 0 C 478 | L     | R2,WSPR           | ENABLE PROGRAM INTERRUPTS       |
| 005192 | 0A 01        | SVC   | PROBLM            | PROBLEM STATE NOW               |
| 005194 | 81 00 C 3D4  | LLR   | FFFFZZ            | TRY PRIV=INST IN PROBLEM STATE  |
| 005198 | 0A 00        | SVC   | 0                 | SUPERVISOR STATE NOW            |
| 00519A | 99 00 C 19A  | HPR   |                   | * NO PRIVILEGED INSTRUCTION INT |
| 00519E | 41 1 0 C 1C0 | LA    | R1,BITBIT         | PSW SWAP ADR IF SPEC INTRPT OK  |
| 0051A2 | 91 0F 0 01B  | TM    | OPRPSW+3(0),X'DF' | IS PRIVILEGED INST INT CODE IN? |
| 0051A6 | 47 8 0 C 1B2 | BC    | 11,P0K1           | BRANCH IF INT CODE IS OK        |

|        |              |        |     |                   |                                 |
|--------|--------------|--------|-----|-------------------|---------------------------------|
| 0051AA | 48 7 0 0 01E |        | LH  | R7,OPRPSW+6(,0)   | GET INTERRUPT ADDRESS           |
| 0051AE | 99 00 7 000  |        | HPR | 0(R7)             | • DISPLAY BAD INST LOCATION     |
| 0051B2 | 58 2 0 C 478 | POK1   | L   | R2,WPSPR          | ENABLE PROGRAM INTERRUPTS       |
| 0051B6 | 0A 00        |        | SVC | 0                 | SUPERVISOR STATE NOW            |
| 0051B8 | 81 00 C 3D5  |        | LLR | FFFFZZ+1          | TRY FOR SPECIFICATION INTERRUPT |
| 0051BC | 99 00 C 1BC  |        | HPR |                   | • NO SPECIFICATION INTERRUPT    |
| 0051C0 | 41 1 0 C 244 | BITBIT | LA  | R1,BADBIT         | PSW SWAP ADR IF BAD BIT FOUND   |
| 0051C4 | 91 9F 0 01B  |        | TM  | OPRPSW+3(0),X'9F' | TEST FOR SPECIFICATIONS INT     |
| 0051C8 | 47 8 0 C 1D4 |        | BC  | 11,CODEOK         | BRANCH IF INT CODE OK           |
| 0051CC | 48 7 0 0 01E |        | LH  | R7,OPRPSW+6(,0)   | GET ADDRESS FROM INT PSW        |
| 0051D0 | 99 00 7 000  |        | HPR | 0(R7)             | • DISPLAY ADDRESS OF BAD INST   |
| 0051D4 | 41 4 0 C 41C | CODEOK | LA  | R4,BITSO1         | BUFFER=PATTERN TO CHECK LR BITS |
| 0051D8 | 41 8 0 0 010 |        | LA  | R8,16(,0)         | BUFFER LENGTH IN HALF-WORDS     |
| 0051DC | 45 A 0 C 0CE |        | BAL | B10,LRBITS        | SUBROUTINE TO CHECK LR BITS     |
| 0051E0 | 0A 00        |        | SVC | 0                 | SUPERVISOR STATE NOW            |
| 0051E2 | 41 4 0 C 44F |        | LA  | R4,INCHSK+3       | R4=FF 1 USE FOR STORE-ADR       |
| 0051E6 | 41 1 0 C 130 |        | LA  | R1,SWAP3          | USE ONLY FF TO GET ADR FOR ST   |
| 0051EA | 41 5 0 C 43C |        | LA  | R5,BITS10         | PATTERN FOR BIT CHECK           |
| 0051EE | 41 8 0 0 008 |        | LA  | R8,8(,0)          | 8-ENTRIES IN PATTERN BUFFER     |
| 0051F2 | 45 A 0 C 0F8 |        | BAL | R10,LRBITS        | CHECK FOR UPPER LIMIT BIT SET   |
| 0051F6 | 0A 00        |        | SVC | 0                 | SUPERVISOR STATE NOW            |
| 0051F8 | 41 1 0 C 12E |        | LA  | R1,SWAP2          | USE PATTERN TO GET STORE ADR    |
| 0051FC | 41 5 0 C 44C |        | LA  | R5,BITS11         | PATTERN FOR BIT CHECK           |
| 005200 | 41 8 0 0 008 |        | LA  | R8,8(,0)          | 8-ENTRIES IN PATTERN BUFFER     |
| 005204 | 45 A 0 C 0F8 |        | BAL | R10,LRBITS        | CHECK FOR LOW-LIMIT-BIT CLEAR   |
| 005208 | 0A 00        |        | SVC | 0                 | SUPERVISOR STATE NOW            |
| 00520A | 41 1 0 C 222 |        | LA  | R1,SKIP           | PSW SWAP ADR IF W-P INT (XRTD)  |
| 00520E | 58 2 0 C 478 |        | L   | R2,WPSPR          | ENABLE WRITE-PROTECT INT        |
| 005212 | 81 00 C 4BC  |        | LLR | ALLBIT            | *** LIMITS = FF FF (UNCOND INV  |
| 005216 | 0A 01        |        | SVC | 1                 | PROBLEM STATE NOW               |
| 005218 | 50 1 0 C 0C8 |        | ST  | R1,TEMP           | TRY STORE; SHOULD GET INTRPT    |
| 00521C | 0A 00        |        | SVC | 0                 | SUPERVISOR STATE NOW            |
| 00521E | 99 00 C 21E  |        | HPR |                   | • NO INTERRUPT 1 SAYS FF > FF   |
| 005222 | 0A 00        | SKIP   | SVC | 0                 | SUPERVISOR STATE NOW            |
| 005224 | 45 8 0 C 05C |        | BAL | B11,CODESS        | CHECK FOR W-P INT CODE IN PSW   |
| 005228 | 41 1 0 C 252 |        | LA  | R1,NOINT          | ADDRESS OF INSTRUCTION CKOUT    |
| 00522C | 58 2 0 C 478 |        | L   | R2,WPSPR          | ENABLE W-P INTERRUPTS           |
| 005230 | 81 00 C 45E  |        | LLR | ALLBIT+2          | *** LIMITS = 00 00 (UNCOND INV  |
| 005234 | 0A 01        |        | SVC | PROBLM            | PROBLEM STATE NOW               |
| 005236 | 50 1 0 C 0C8 |        | ST  | R1,TEMP           | TRY STORE; SHOULD GET INTRPT    |
| 00523A | 0A 00        |        | SVC | 0                 | SUPERVISOR STATE NOW            |
| 00523C | 99 00 C 23C  |        | HPR |                   | • NO INTERRUPT; SAYS 00 NEQ 00  |
| 005240 | 00000002     | TWOCON | DC  | F'2'              | CONSTANT = 00000002             |
| 005244 | 0A 00        | BADBIT | SVC | 0                 | SUPERVISOR STATE NOW            |



|        |               |        |      |                  |                                 |
|--------|---------------|--------|------|------------------|---------------------------------|
| 005246 | 5B 4 0 C 240  |        | S    | R4,TWOCON        | SUBTRACT BIAS FROM POINTER      |
| 00524A | 48 1 0 4 000  |        | LH   | R1,0(,R4)        | GET LIMITS ATTEMPTED            |
| 00524E | 99 00 1 000   |        | HPR  | 0(R1)            | BAD LIMITS SHOWN (COMPARED EQL) |
| 005252 | 0A 00         | NOINT  | SVC  | 0                | SUPERVISOR STATE NOW            |
| 005254 | 45 B 0 C 05C  |        | BAL  | B11,CODESS       | CHECK FOR VALID INTERRUPT CODE  |
| 005258 | 58 9 0 C 3CC  |        | L    | R9,ZEROS         | RX RS SI INSTRUCTION CHECKOUT   |
| 00525C | 41 3 0 C 320  |        | LA   | R3,INSTRN        | R3=POINTER ON TABLE             |
| 005260 | 41 4 0 0 009  |        | LA   | R4,9(,0)         | R4=NUMBER OF INSTRNS            |
| 005264 | 41 7 0 C 2F2  |        | LA   | R7,UNXPTD        | R7=INTERRUPT HALT ADR           |
| 005268 | 41 8 0 C 3D8  |        | LA   | R8,LRPSW         | R8=PSW/ALLOW W-P INT            |
| 00526C | 81 00 C 3D4   |        | LLR  | FFFFZ2           | SET LIMITS TO ALLOW STORE       |
|        |               |        | CNOP | 0,4              | FORCE FULL-WORD ALIGNMENT       |
| 005270 | 45 A 0 C 082  | INST1  | BAL  | B10,INTRPT       | SETUP FOR CURRENT INST CHECK    |
| 005274 | 00000000      |        | DC   | F'0'             | TRY INSTRUCTION ; NO INT XPTD   |
| 005278 | 46 4 0 C 270  |        | BCT  | R4,INST1         | FINISH ALL INSTRUCTIONS IN TBL  |
| 00527C | 0A 00         |        | SVC  | 0                | SUPERVISOR STATE NOW            |
| 00527E | 41 3 0 C 344  |        | LA   | R3,SSINST        |                                 |
| 005282 | 41 4 0 0 010  |        | LA   | R4,16(,0)        | SS INSTRUCTION (16 OF THEM) CHK |
| 005286 | 41 7 0 C 2F2  |        | LA   | R7,UNXPTD        | R7 = UNEXPTD INT ADR            |
| 00528A | 41 8 0 C 3D8  |        | LA   | R8,LRPSW         | R8 = ADR FOR SSH                |
| 00528E | 0700          |        | CNOP | 0,4              | FORCE FULL-WORD ALIGNMENT       |
| 005290 | 45 A 0 C 082  | INST2A | BAL  | B10,INTRPT       | SETUP CHECK                     |
| 005294 | 00000000 0000 |        | DC   | X'0000000000000' | TRY SS INSTRUCTION              |
| 00529A | 46 4 0 C 290  |        | BCT  | R4,INST2A        | FINISH ALL 16 INST IN TABLE     |
| 00529E | 17 4 4        |        | XR   | R4,R4            | RE=ALIGN ON FULL-WORD BOUNDARY  |
| 0052A0 | 17 1 1        | INTXPT | XR   | R1,R1            | CLEAR INT ADR                   |
| 0052A2 | 17 2 2        |        | XR   | R2,R2            | DISABLE ALL INTERRUPTS          |
| 0052A4 | 0A 00         |        | SVC  | 0                | SUPERVISOR STATE NOW            |
| 0052A6 | 41 3 0 C 320  |        | LA   | R3,INSTRN        | TRY TO GET WRITE=PROTECT INTRPV |
| 0052AA | 41 4 0 0 009  |        | LA   | R4,9(,0)         | R4 = NUMBER OF RX RS SI INST    |
| 0052AE | 41 7 0 C 2CC  |        | LA   | R7,INST3A        | R3 = RX/RS/SI INSTRUCTION TABLE |
| 0052B2 | 41 8 0 C 3D8  |        | LA   | R8,LRPSW         | R8 = PSW FOR SSH USE ; R7=INT   |
| 0052B6 | 50 9 0 C 3D0  |        | ST   | R9,ZEROSX        | CLEAR LIMITS REG (UNCOND INT)   |
| 0052BA | 81 00 C 3CC   |        | LLR  | ZEROS            | SET LIMIT FOR UNCONDITIONAL INT |
| 0052BE | 0700          |        | CNOP | 0,4              | FORCE FULL-WORD ALIGNMENT       |
| 0052C0 | 45 A 0 C 082  | INST2B | BAL  | R10,INTRPT       | SETUP INSTRUCTION CHECKOUT      |
| 0052C4 | 00000000      |        | DC   | F'0'             | TRY RX RS SI INSTRUCTION        |
| 0052C8 | 47 F 0 C 2F2  |        | BC   | 15,ERROR         | ERROR = NO INTERRUPT GENERATED  |
| 0052CC | 0A 00         | INST3A | SVC  | 0                | SUPERVISOR STATE NOW            |
| 0052CE | 45 B 0 C 05C  |        | BAL  | B11,CODESS       | CHECK FOR VALID INTERRUPT CODE  |
| 0052D2 | 46 4 0 C 2C0  |        | BCT  | R4,INST2B        | FINISH ALL 16 RX/RS/SI INST     |
| 0052D6 | 0700          |        | CNOP | 0,4              | FORCE FULL-WORD ALIGNMENT       |
| 0052D8 | 41 3 0 C 344  |        | LA   | R3,SSINST        | R3 = ADDRESS / SS INST TABLE    |
| 0052DC | 41 4 0 0 010  |        | LA   | R4,16(,0)        | R4 = NUMBER OF SS INST          |

|        |                   |        |      |                                                   |                                 |
|--------|-------------------|--------|------|---------------------------------------------------|---------------------------------|
| 0052E0 | 41 7 0 C 304      |        | LA   | R7,INST4                                          | R7 = INTERRUPT RETURN ADDRESS   |
| 0052E4 | 41 8 0 C 308      |        | LA   | R8,LRPSW                                          | R8 = SSM PSW                    |
|        |                   |        | CNOP | 0,4                                               | FORCE FULL-WORD ALIGNMENT       |
| 0052E8 | 45 A 0 C 082      | INST3B | BAL  | B10,INTRPT                                        | SETUP SS INSTRUCTION CHECK      |
| 0052EC | 00000000          |        | DC   | F'0'                                              | TRY AN SS INSTRUCTION           |
| 0052F0 | 0000              |        | DC   | X'0000'                                           | TRY AN SS INSTRUCTION           |
| 0052F2 | 0A 00             | ERROR  | SVC  | 0                                                 | SUPERVISOR STATE NOW            |
| 0052F4 | 45 B 0 C 05C      |        | BAL  | B11,CODESS                                        | CHECK FOR VALID INTERRUPT CODE  |
| 0052F8 | 48 1 0 A 000      |        | LH   | R1,0(R10)                                         | PICKUP BAD INSTRUCTION CODE     |
| 0052FC | 99 00 1 000       |        | HPR  | 0(R1)                                             | • DISPLAY ERRING OP/R1/R2 IN AO |
| 005300 | 47 F 0 C 316      |        | BC   | 15,OUT                                            | EXIT FROM LLR TEST              |
|        | 0052F2            | UNXPTD | EQU  | ERROR                                             | ERROR STOP ADDRESS              |
| 005304 | 0A 00             | INST4  | SVC  | 0                                                 | SUPERVISOR STATE NOW            |
| 005306 | 45 B 0 C 05C      |        | BAL  | B11,CODESS                                        | CHECK FOR VALID INTERRUPT CODE  |
| 00530A | 46 4 0 C 2E8      |        | BCT  | R4,INST3B                                         | TRY ALL 16 SS INSTRUCTIONS      |
| 00530E | 47 F 0 C 316      |        | BC   | 15,OUT                                            | ALL DONE...EXIT TO LOADER       |
| 005312 | 99 00 C 312       | NOSLLR | HPR  |                                                   | • NO LIMITS REGISTER INSTALLED  |
| 005316 | 0A 00             | OUT    | SVC  | 0                                                 | SET SUPERVISOR STATE NOW        |
| 005318 | 82 00 C 3E0       |        | LPSW | LRPSW2                                            | ALL DONE...EXIT TO LOADER NOW   |
| 00531C | 00000000          |        | DC   | F'0'                                              | FORCE FULL-WORD ALIGNMENT       |
|        |                   | •      |      | INSTRUCTION TYPES TO CHECK LIMITS-REGISTER OPTION |                                 |
| 005320 | 40 1 0 0 F80      | INSTRN | STH  | 1,MM(,0)                                          | LOW MEMORY : STORE HALF         |
| 005324 | 42 1 0 0 F80      |        | STC  | 1,MM(,0)                                          | LOW MEMORY : STORE CHR          |
| 005328 | 50 1 0 0 F80      |        | ST   | 1,MM(,0)                                          | LOW MEMORY : STORE WORD         |
| 00532C | 90 1 1 0 F80      |        | STM  | 1,1,MM(0)                                         | LOW MEMORY : STORE MULTIPLE     |
| 005330 | 92 0F 0 F80       |        | MVI  | MM(0),X'OF'                                       | LOW MEMORY : MOVE IMMEDIATE     |
| 005334 | 93 0F 0 F80       |        | AI   | MM(0),X'OF'                                       | LOW MEMORY : ADD IMMEDIATE      |
| 005338 | 94 0F 0 F80       |        | NI   | MM(0),X'OF'                                       | LOW MEMORY : AND IMMEDIATE      |
| 00533C | 96 0F 0 F80       |        | OI   | MM(0),X'OF'                                       | LOW MEMORY : OR IMMEDIATE       |
| 005340 | 97 0F 0 F80       |        | XI   | MM(0),X'OF'                                       | LOW MEMORY : XOR IMMEDIATE      |
| 005344 | 01 00 0 F80 C 3C8 | SSINST | MVN  | MM(1,0),FS                                        | LOW MEMORY : MOVE NUMERICS      |
| 00534A | 0700              |        | CNOP | 0,4                                               | REALIGN ON FULL-WORD BOUNDARY   |
| 00534C | 02 00 0 F80 C 3C8 |        | MVC  | MM(1,0),FS                                        | LOW MEMORY : MOVE CHARACTERS    |
| 005352 | 0700              |        | CNOP | 0,4                                               | REALIGN ON FULL-WORD BOUNDARY   |
| 005354 | 03 00 0 F80 C 3C8 |        | MVZ  | MM(1,0),FS                                        | LOW MEMORY : MOVE ZONES         |
| 00535A | 0700              |        | CNOP | 0,4                                               | REALIGN ON FULL-WORD BOUNDARY   |
| 00535C | 04 00 0 F80 C 3C8 |        | NC   | MM(1,0),FS                                        | LOW MEMORY : AND CHARACTERS     |
| 005362 | 0700              |        | CNOP | 0,4                                               | REALIGN ON FULL-WORD BOUNDARY   |
| 005364 | 06 00 0 F80 C 3C8 |        | OC   | MM(1,0),FS                                        | LOW MEMORY : OR CHARACTERS      |
| 00536A | 0700              |        | CNOP | 0,4                                               | REALIGN ON FULL-WORD BOUNDARY   |
| 00536C | 07 00 0 F80 C 3C8 |        | XC   | MM(1,0),FS                                        | LOW MEMORY : XOR CHARACTERS     |
| 005372 | 0700              |        | CNOP | 0,4                                               | REALIGN ON FULL-WORD BOUNDARY   |
| 005374 | 0C 00 0 F80 C 3C8 |        | TR   | MM(1,0),FS                                        | LOW MEMORY : TRANSLATE          |
| 00537A | 0700              |        | CNOP | 0,4                                               | REALIGN ON FULL-WORD BOUNDARY   |

|        |                    |        |                   |                                 |
|--------|--------------------|--------|-------------------|---------------------------------|
| 00537C | DE 00 0 F80 C 3C8  | ED     | MM(1,0),FS        | LOW MEMORY ; EDIT               |
| 005382 | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 005384 | F1 0 0 0 F80 C 3C8 | MVO    | MM(1,0),FS(1)     | LOW ; MOVE WITH OFFSET          |
| 00538A | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 00538C | F2 0 3 0 F80 C 3C8 | PACK   | MM(1,0),FS        | LOW MEMORY ; PACK               |
| 005392 | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 005394 | F3 0 3 0 F80 C 3C8 | UNPK   | MM(1,0),FS        | LOW MEMORY ; UNPACK             |
| 00539A | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 00539C | F8 0 0 0 F80 C 3C8 | ZAP    | MM(1,0),FS(1)     | LOW MEMORY ; ZERO/ADD DECIMAL   |
| 0053A2 | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 0053A4 | FA 0 0 0 F80 C 3C8 | AP     | MM(1,0),FS(1)     | LOW MEMORY ; ADD DECIMAL        |
| 0053AA | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 0053AC | FB 0 0 0 F80 C 3C8 | SP     | MM(1,0),FS(1)     | LOW MEMORY ; SUBTRACT DECIMAL   |
| 0053B2 | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 0053B4 | FC 0 0 0 F80 C 3C8 | MP     | MM(1,0),FS(1)     | LOW MEMORY ; MULTIPLY DECIMAL   |
| 0053BA | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
| 0053BC | FD 3 0 C 410 C 418 | DP     | DATA1(4),DATA2(1) |                                 |
| 0053C2 | 0700               | CNOP   | 0,4               | REALIGN ON FULL-WORD BOUNDARY   |
|        | 000F80             | MM     | EQU               | ARBITRARY ADDRESS FOR STORE F80 |
| 0053C4 | 00000004           | FOUR   | DC                | FULL-WORD CONSTANT ; INST ADR   |
| 0053C8 | FFFFFFFF           | FS     | DC                | WORKING CONSTANT EQUAL -1       |
| 0053CC | 00000000           | ZEROS  | DC                | CONSTANT = 00000000 HI=LOW CHK  |
| 0053D0 | 01000000           | ZEROSX | DC                | CONSTANT = 01000000 LOW MEN CK  |
| 0053D4 | FF000000           | FFFFZZ | DC                | CONSTANT = FF000000 GENERAL     |
|        |                    |        | CNOP              | ALIGN ON DOUBLE-WORD BOUNDARY   |
| 0053D8 | 82000000           | LRPSW  | DC                | ALLOW WRITE-PROTECT INTERRUPTS  |
| 0053DC | 000053D8           |        | DC                | PSW ADDRESS FOR START OF LLR CK |
| 0053E0 | 38000000           | LRPSW2 | DC                | ALLOW I/O INTERRUPTS UPON EXIT  |
| 0053E4 | 00000214           |        | DC                | PSW ADDRESS FOR FINAL EXIT/LLR  |
| 0053E8 | 02010000           | PRVPSW | DC                | ALLOW W-P INT/PROGRAM INT       |
| 0053EC | 0000519E           |        | DC                | PSW-SWAP ADR FOR PROG INT       |
| 0053F0 | FFFFFFFF           | ALLFS  | DC                | CONSTANT = FFFFFFFF HI=LOW CHK  |
| 0053F4 | 00000001           | MSG    | DC                | WRITE CMD FOR CONSOLE           |
| 0053F8 | 08000000           | MSGPSW | DC                | PSW FOR CONSOLE MESSAGE         |
| 0053FC | 0000513A           |        | DC                | ADDRESS FOR INTERRUPT SWAP(PSW) |
| 005400 | 0002               |        | DC                | SUBCHANNEL CONTROL WORD (SCW)   |
| 005402 | 5404               |        | DC                | BCW ADDRESS FOR SCW USE         |
| 005404 | 0080               | MSGBCW | DC                | BCW BYTE COUNT = 008            |
| 005406 | 5408               |        | DC                | ADDRESS OF PRINT BUFFER/MESSAGE |
| 005408 | 0D25               | COMMSG | DC                | LINE FEED/CARRIAGE RETURN       |
| 00540A | D34BD94B           |        | DC                | LIMITS OPTION...CONSOLE MESSAGE |
| 00540E | 0D25               |        | DC                | LINE FEED/CARRIAGE RETURN       |
|        |                    |        | CNOP              | ALIGN ON FULL-WORD BOUNDARY     |
| 005410 | 0006767C 00000000  | DATA1  | DC                | X'0006767C00000000'             |

|        |          |        |      |              |          |                                 |
|--------|----------|--------|------|--------------|----------|---------------------------------|
| 005418 | 2C000000 | DATA2  | DC   | X'2C000000'  | 11111111 | 01111111                        |
| 00541C | FF7F     | BITS01 | DC   | X'FF7F'      | 11111111 | 10111111                        |
| 00541E | FFBF     |        | DC   | X'FFBF'      | 11111111 | 11011111                        |
| 005420 | FFDF     |        | DC   | X'FFDF'      | 11111111 | 11101111                        |
| 005422 | FFEF     |        | DC   | X'FFEF'      | 11111111 | 11110111                        |
| 005424 | FFF7     |        | DC   | X'FFF7'      | 11111111 | 11111011                        |
| 005426 | FFFB     |        | DC   | X'FFFB'      | 11111111 | 11111011                        |
| 005428 | FFFD     |        | DC   | X'FFFD'      | 11111111 | 11111011                        |
| 00542A | FFFE     |        | DC   | X'FFFE'      | 11111111 | 11111011                        |
| 00542C | 0100     | BITS00 | DC   | X'0100'      | 00000001 | 00000000                        |
| 00542E | 0200     |        | DC   | X'0200'      | 00000010 | 00000000                        |
| 005430 | 0400     |        | DC   | X'0400'      | 00000100 | 00000000                        |
| 005432 | 0800     |        | DC   | X'0800'      | 00001000 | 00000000                        |
| 005434 | 1000     |        | DC   | X'1000'      | 00010000 | 00000000                        |
| 005436 | 2000     |        | DC   | X'2000'      | 00100000 | 00000000                        |
| 005438 | 4000     |        | DC   | X'4000'      | 01000000 | 00000000                        |
| 00543A | 8000     |        | DC   | X'8000'      | 10000000 | 00000000                        |
| 00543C | 7F00     | BITS10 | DC   | X'7F00'      | 01111111 | 00000000                        |
| 00543E | BF00     |        | DC   | X'BF00'      | 10111111 | 00000000                        |
| 005440 | DF00     |        | DC   | X'DF00'      | 11011111 | 00000000                        |
| 005442 | EF00     |        | DC   | X'EF00'      | 11101111 | 00000000                        |
| 005444 | F700     |        | DC   | X'F700'      | 11110111 | 00000000                        |
| 005446 | FB00     |        | DC   | X'FB00'      | 11111011 | 00000000                        |
| 005448 | FD00     |        | DC   | X'FD00'      | 11111101 | 00000000                        |
| 00544A | FE00     |        | DC   | X'FE00'      | 11111110 | 00000000                        |
| 00544C | 0101     | BITS11 | DC   | X'0101'      | 00000001 | 00000001                        |
| 00544E | 0202     |        | DC   | X'0202'      | 00000010 | 00000010                        |
| 005450 | 0404     |        | DC   | X'0404'      | 00000100 | 00000100                        |
| 005452 | 0808     |        | DC   | X'0808'      | 00001000 | 00001000                        |
| 005454 | 1010     |        | DC   | X'1010'      | 00010000 | 00010000                        |
| 005456 | 2020     |        | DC   | X'2020'      | 00100000 | 00100000                        |
| 005458 | 4040     |        | DC   | X'4040'      | 01000000 | 01000000                        |
| 00545A | 8080     |        | DC   | X'8080'      | 10000000 | 10000000                        |
| 00545C | FFFF     | ALLBIT | DC   | X'FFFF'      | 11111111 | 11111111                        |
| 00545E | 0000     | NOBIT  | DC   | X'0000'      | 00000000 | 00000000                        |
|        |          |        | CNOP | 0,B          |          |                                 |
| 005460 | 00000000 | SVCPSW | DC   | 2F'00000000' |          | PSW USED TO EXIT FROM SVC CALLS |
|        | 00000000 |        |      |              |          |                                 |
| 005468 | 0001FFFF | ADRMSK | DC   | X'0001FFFF'  |          | MASK FOR ADDRESS OF NEXT INST   |
| 00546C | 000000FF | INCHSK | DC   | X'000000FF'  |          | MASK FOR INT=CODE (R1,R2/SVC)   |
| 005470 | 00000000 | SVCNEW | DC   | F'00000000'  |          | NEW SVC PSW                     |
| 005474 | 00005028 |        | DC   | A(SUPER)     |          | NEW SVC PSW                     |
| 005478 | 00000082 | WSPR   | DC   | X'00000082'  |          | CONSTANT FOR                    |
| 00547C | FFFFFFFF | FWADR  | DC   | X'FFFFFFFF'  |          | CONSTANT FOR FULL-WORD ADR      |

005480

0F000000  
005000

0F00

DC  
END

X'0F000000'  
LLRTST

CONSTANT FOR FIRST LR CHECK



|        | \$SELONE | START<br>USING | 20480<br>*,15 |
|--------|----------|----------------|---------------|
| 000001 | B1       | EQU            | 1             |
| 000002 | B2       | EQU            | 2             |
| 000003 | B3       | EQU            | 3             |
| 000004 | B4       | EQU            | 4             |
| 000005 | B5       | EQU            | 5             |
| 000006 | B6       | EQU            | 6             |
| 000007 | B7       | EQU            | 7             |
| 000008 | B8       | EQU            | 8             |
| 000009 | B9       | EQU            | 9             |
| 00000A | B10      | EQU            | 10            |
| 00000B | B11      | EQU            | 11            |
| 00000C | B12      | EQU            | 12            |
| 00000D | B13      | EQU            | 13            |
| 00000E | B14      | EQU            | 14            |
| 00000F | B15      | EQU            | 15            |
| 000000 | R0       | EQU            | 0             |
| 000001 | R1       | EQU            | 1             |
| 000002 | R2       | EQU            | 2             |
| 000003 | R3       | EQU            | 3             |
| 000004 | R4       | EQU            | 4             |
| 000005 | R5       | EQU            | 5             |
| 000006 | R6       | EQU            | 6             |
| 000007 | R7       | EQU            | 7             |
| 000008 | R8       | EQU            | 8             |
| 000009 | R9       | EQU            | 9             |
| 00000A | R10      | EQU            | 10            |
| 00000B | R11      | EQU            | 11            |
| 00000C | R12      | EQU            | 12            |
| 00000D | R13      | EQU            | 13            |
| 00000E | R14      | EQU            | 14            |
| 00000F | R15      | EQU            | 15            |

| EJECT  |        |     |        |
|--------|--------|-----|--------|
| 000000 | S0ABS  | EQU | 0      |
| 000010 | S1ABS  | EQU | 16     |
| 000020 | S2ABS  | EQU | 32     |
| 000030 | S3ABS  | EQU | 48     |
| 000040 | S4ABS  | EQU | 64     |
| 000050 | S5ABS  | EQU | 80     |
| 000060 | S6ABS  | EQU | 96     |
| 000070 | S7ABS  | EQU | 112    |
| 000080 | S8ABS  | EQU | 128    |
| 000090 | S9ABS  | EQU | 144    |
| 0000A0 | S10ABS | EQU | 160    |
| 0000B0 | S11ABS | EQU | 176    |
| 0000C0 | S12ABS | EQU | 192    |
| 0000D0 | S13ABS | EQU | 208    |
| 0000E0 | S14ABS | EQU | 224    |
| 0000F0 | S15ABS | EQU | 240    |
| 000190 | TIMSCW | EQU | 400    |
| 0001A0 | S01CSW | EQU | 416    |
| 000008 | OSVPSW | EQU | X'008' |
| 000018 | OPRPSW | EQU | X'018' |
| 000028 | OTHPSW | EQU | X'028' |
| 000038 | OMSPSW | EQU | X'038' |
| 000048 | OMNPSW | EQU | X'048' |
| 000058 | OS1PSW | EQU | X'058' |
| 000068 | OS2PSW | EQU | X'068' |
| 000078 | ONUPSW | EQU | X'078' |
| 000088 | NSVPSW | EQU | X'088' |
| 000098 | NPRPSW | EQU | X'098' |
| 0000A8 | NTMPSW | EQU | X'0A8' |
| 0000B8 | NMSPSW | EQU | X'0B8' |
| 0000C8 | NMNPSW | EQU | X'0C8' |
| 0000D8 | NS1PSW | EQU | X'0D8' |
| 0000E8 | NS2PSW | EQU | X'0E8' |
| 000114 | IPLBCW | EQU | X'114' |
| 000190 | TCW    | EQU | X'190' |
| 0001A0 | CSW1   | EQU | X'1A0' |
| 0001A8 | CSW2   | EQU | X'1A8' |
| 000008 | ZERO   | EQU | 8      |
| 000007 | NONZ   | EQU | 7      |



|           |                   |        |                        |
|-----------|-------------------|--------|------------------------|
| 000004    | LSZ               | EQU    | 4                      |
| 00000C    | LEZ               | EQU    | 12                     |
| 000002    | GTZ               | EQU    | 2                      |
| 00000A    | GEZ               | EQU    | 10                     |
| 000008    | EQL               | EQU    | 8                      |
| 000007    | NEQ               | EQU    | 7                      |
| 00000F    | UNCOND            | EQU    | 15                     |
| 000004    | MIXED             | EQU    | 4                      |
| 000001    | ONES              | EQU    | 1                      |
| 00000E    | NONES             | EQU    | 14                     |
| * * * * * |                   |        |                        |
| 005000    | 58 F 0 0 050      | MESAG1 | L R15, S5ABS(,0)       |
| 005004    | D2 03 F 5E4 F 5F0 | MVC    | MSGBCW(4), MSGCON      |
| 00500A    | 80 00 F 5D8       | SSM    | MSGPSW                 |
| 00500E    | 98 0 3 F 5D4      | LM     | R0, R3, MSG            |
| 005012    | 90 1 2 0 088      | STM    | R1, R2, NMSPSW(0)      |
| 005016    | 50 3 0 0 100      | ST     | R3, 256(,0)            |
| 00501A    | 9C 00 0 080       | SIO    | 128(0)                 |
| 00501E    | 47 F 0 F 01E      | BC     | 15, *                  |
| 005022    | D2 03 0 0C0 F 600 | BEGIN1 | MVC S12ABS(4,0), ZERSA |
| 005028    | 58 8 0 F 5CC      | L      | R8, BIGONE             |
| 00502C    | D2 37 0 088 F 600 | MVC    | NSVPSW(56,0), ZERSA    |
| 005032    | 41 7 0 F 05A      | LA     | R7, ZIPPR1             |
| 005036    | 50 7 0 F 538      | ST     | R7, PSWC03             |
| 00503A    | D2 07 0 0A8 F 534 | MVC    | NTMPSW(8,0), PSWC01    |
| 005040    | D2 03 F 518 F 5C8 | MVC    | TIMWD1(4), WONMS1      |
| 005046    | 41 7 0 F 518      | LA     | R7, TIMWD1             |
| 00504A    | 50 7 0 0 190      | ST     | R7, TIMSCW(,0)         |
| 00504E    | 80 00 F 584       | SSM    | INTER4                 |
| 005052    | 46 8 0 F 052      | ZIPPER | BCT R8, ZIPPER         |
| 005056    | 99 00 0 000       | HPR    | 0(R0)                  |
| 00505A    | D2 18 F 534 F 600 | ZIPPR1 | MVC PSWC01(28), ZERSA  |
| 005060    | 41 7 0 F 092      | LA     | R7, ZAPA               |
| 005064    | 50 7 0 F 538      | ST     | R7, PSWC03             |
| 005068    | D2 07 0 0D8 F 534 | MVC    | NS1PSW(8,0), PSWC01    |
| 00506E    | 41 7 0 F 504      | LA     | R7, DATA1A             |
| 005072    | 5A 7 0 F 594      | A      | R7, COMC06             |
| 005076    | 50 7 0 F 558      | ST     | R7, CCWCO1             |
| 00507A    | D2 03 F 55C F 56C | MVC    | CCWC03(4), EIGHT       |
| 005080    | 41 0 0 F 558      | LA     | R0, CCWC01             |
| 005084    | D2 07 0 1A0 F 600 | MVC    | SO1CSW(8,0), ZERSA     |
| 00508A    | 80 00 F 578       | SSM    | INTER1                 |
| 00508E    | 47 F 0 F 096      | BC     | UNCOND, Z1PA           |
| 005092    | 99 00 0 000       | ZAPA   | HPR 0(R0)              |

CLEAR REGISTER TWELVE

CLEAR NEW PSW LOCATIONS  
SET UP TIMER NEW PSW

LOAD TIMER WITH IMS CWT

ALLOW TIMER INTERRUPT  
WAIT FOR TIMER INTERRUPT  
TIMER DISABLED  
CLEAR STORAGE AREAS  
SET UP FIRST PSW (SEL)

LOAD SELECTOR 1 NEW PSW  
SET UP FIRST CCW  
SET COMMAND CODE OF WRITE

SET UP FOR EIGHT BYTES  
SET UP FIRST CAW  
CLEAR SELECTOR 1 CSW  
ALLOW SELECTOR 1 INTERRUPT  
BRANCH IF NO INTERRUPT  
INTERRUPT W/O SIO OR TESTR

|        |                   |       |     |                    |                            |
|--------|-------------------|-------|-----|--------------------|----------------------------|
| 005096 | 58 7 0 F 600      | ZIPA  | L   | R7,ZERSA           | CLEAR REGISTER 7 FOR COMP  |
| 00509A | 57 7 0 0 1A0      |       | X   | R7,S01CSW(,0)      | CHECK SEL 1 CSW FOR ZEROS  |
| 00509E | 47 8 0 F 0AA      |       | BC  | B,ZIPB             | BRANCH IF ZERO             |
| 0050A2 | 48 C 0 0 1A0      | ZAPB  | LH  | R12,S01CSW(,0)     | DISPLAY SEL 1 CSW          |
| 0050A6 | 99 00 C 000       |       | HPR | O(R12)             | SEL 1 CSW NOT CLEARED      |
| 0050AA | 41 7 0 F 0CC      | ZIPB  | LA  | R7,ZAPC            | SET UP SECOND PSW (SEL)    |
| 0050AE | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 0050B2 | 02 07 0 0D8 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 0050B8 | 9C 00 0 100       |       | SIO | 256(0)             |                            |
| 0050BC | 47 1 0 F 0D4      |       | BC  | 1,ZIPC             | BRANCH IF COND CODE EQU 3  |
| 0050C0 | 48 C 0 0 058      | ZAPBA | LH  | R12,91(,0)         | DISPLAY CONDITION CODE     |
| 0050C4 | 99 00 C 000       |       | HPR | O(R12)             | INCORRECT CONDITION CODE   |
| 0050C8 | 47 F 0 F 0D4      |       | BC  | UNCOND,ZIPC        | RETURN TO PROGRAM          |
| 0050CC | 48 C 0 0 1A0      | ZAPC  | LH  | R12,416(,0)        | DISPLAY DEVICE STATUS      |
| 0050D0 | 99 00 C 000       |       | HPR | O(R12)             | INTER W/O DEVICE OR TESTR  |
| 0050D4 | 80 00 F 574       | ZIPC  | SSM | NOINTA             | ALLOW NO INTERRUPTS        |
| 0050D8 | 41 7 0 F 108      |       | LA  | R7,ZAPE            | SET UP THIRD PSW (SEL)     |
| 0050DC | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 0050E0 | 02 07 0 0D8 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 0050E6 | 41 0 0 F 558      |       | LA  | R0,CCWC01          | SET UP SECOND CAW          |
| 0050EA | 5A 0 0 F 500      |       | A   | R0,TSTBIT          | SET TESTER BIT             |
| 0050EE | 41 7 0 F 504      |       | LA  | R7,DATA1A          | SET UP SECOND CCW          |
| 0050F2 | 5A 7 0 F 594      |       | A   | R7,COMC06          | SET COMMAND CODE OF WRITE  |
| 0050F6 | 50 7 0 F 558      |       | ST  | R7,CCWC01          |                            |
| 0050FA | 02 03 F 56C F 56C |       | MVC | CCWC03(4),EIGHT    | SET UP FOR EIGHT BYTES     |
| 005100 | 80 00 F 578       |       | SSM | INTER1             | ALLOW SELECTOR 1 INTERRUPT |
| 005104 | 47 F 0 F 110      |       | BC  | UNCOND,ZIPD        | BRANCH IF NO INTERRUPT     |
| 005108 | 48 C 0 0 059      | ZAPE  | LH  | R12,89(,0)         | DISPLAY PSW INTERRUPT CODE |
| 00510C | 99 00 C 000       |       | HPR | O(R12)             | INTERUPT W/O START I/O     |
| 005110 | 41 7 0 F 154      | ZIPD  | LA  | R7,ZIPF            | SET UP FOURTH PSW (SEL)    |
| 005114 | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 005118 | 02 07 0 0D8 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 00511E | 41 7 0 F 14C      |       | LA  | R7,ZAPG            | SET UP FIFTH PSW (TIMER)   |
| 005122 | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 005126 | 02 03 0 190 F 500 |       | MVC | TIMSCW(4,0),TSTBIT | DISABLE TIMER              |
| 00512C | 02 07 0 0A8 F 534 |       | MVC | NTMPSW(8,0),PSWC01 | LOAD TIMER NEW PSW         |
| 005132 | 02 03 F 518 F 500 |       | MVC | TIMWD1(4),TFMSD1   | LOAD TIMER WORD WITH FFF   |
| 005138 | 41 7 0 F 518      |       | LA  | R7,TIMWD1          | SET UP TIMER CONTROL WORD  |
| 00513C | 50 7 0 0 190      |       | ST  | R7,TIMSCW(,0)      | STORE TIMER CONTROL WORD   |
| 005140 | 80 00 F 580       |       | SSM | INTER3             | ALLOW SEL1, TIME INTERRUPT |
| 005144 | 9C 00 0 100       |       | SIO | 256(0)             |                            |
| 005148 | 47 F 0 F 148      | ZIPE  | BC  | UNCOND,ZIPE        | LOOP WAITING FOR INTERRUPT |
| 00514C | 48 C 0 0 1A0      | ZAPG  | LH  | R12,416(,0)        | DISPLAY DEVICE STATUS      |
| 005150 | 99 00 C 000       |       | HPR | O(R12)             | SELECTOR INTERRUPT FAILED  |

|        |                   |      |     |                    |                            |
|--------|-------------------|------|-----|--------------------|----------------------------|
| 005154 | 02 07 F 53C 0 058 | ZIPF | MVC | LOOKA(8),OSIPSW(0) | CALL UP OLD SEL1 PSW       |
| 00515A | 58 6 0 F 580      |      | L   | R6,CONST5          | LOAD REG 6 WITH MASK WORD  |
| 00515E | 54 6 0 F 540      |      | N   | R6,LOOK1A          | CHECK OLD SEL1 COND CODE   |
| 005162 | 47 8 0 F 16E      |      | BC  | 8,ZIPG             | BRANCH IF COND CODE EQU 0  |
| 005166 | 48 C 0 0 05B      | ZAPH | LH  | R12,91(,0)         | DISPLAY CONDITION CODE     |
| 00516A | 99 00 C 000       |      | HPR | 0(R12)             | CONDITION CODE NOT ZERO    |
| 00516E | 02 01 F 53C 0 1A0 | ZIPG | MVC | LOOKA(2),SOICSW(0) | CALL UP SELECTOR 1 CSW     |
| 005174 | 07 01 F 53C F 5B8 |      | XC  | LOOKA(2),COMST1    | CHECK SELECTOR 1CSW        |
| 00517A | 47 8 0 F 186      |      | BC  | 8,ZIPH             | BRANCH IF CORRECT          |
| 00517E | 48 C 0 0 1A0      | ZAPI | LH  | R12,416(,0)        | DISPLAY CSW DEVICE STATUS  |
| 005182 | 99 00 C 000       |      | HPR | 0(R12)             | INCORRECT SELECTOR 1 CSW   |
| 005186 | 07 07 F 544 F 504 | ZIPH | XC  | STORE6(8),DATA1A   | COMPARE INPUT WITH OUTPUT  |
| 00518C | 47 8 0 F 198      |      | BC  | 8,ZIPI             | BRANCH IF EQUAL            |
| 005190 | 48 C 0 F 544      | ZAPJ | LH  | R12,STORE6         | DISPLAY FIRST INPUT WORD   |
| 005194 | 99 00 C 000       |      | HPR | 0(R12)             | INPUT NOT EQUAL TO OUTPUT  |
| 005198 | 80 00 F 574       | ZIPI | SSM | NOINTA             | ALLOW NO INTERRUPTS        |
| 00519C | 41 7 0 F 1F4      |      | LA  | R7,ZIPK            | SET UP SIXTH PSW (SEL)     |
| 0051A0 | 50 7 0 F 538      |      | ST  | R7,PSWC03          |                            |
| 0051A4 | 02 07 0 008 F 534 |      | MVC | NSIPSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 0051AA | 41 0 0 F 558      |      | LA  | R0,CCWC01          | SET UP THIRD CAW           |
| 0051AE | 5A 0 0 F 500      |      | A   | R0,TSTBIT          | SET TESTER BIT             |
| 0051B2 | 41 7 0 F 50C      |      | LA  | R7,DATA3A          | SET UP THIRD CCW           |
| 0051B6 | 5A 7 0 F 594      |      | A   | R7,COMC06          | SET COMMAND CODE OF WRITE  |
| 0051BA | 50 7 0 F 558      |      | ST  | R7,CCWC01          |                            |
| 0051BE | 02 03 F 55C F 56C |      | MVC | CCWC03(4),EIGHT    | SET UP FOR EIGHT BYTES     |
| 0051C4 | 41 7 0 F 1EC      |      | LA  | R7,ZAPK            | SET UP SEVENTH PSW (TIME)  |
| 0051C8 | 50 7 0 F 538      |      | ST  | R7,PSWC03          |                            |
| 0051CC | 02 07 0 0A8 F 534 |      | MVC | NTMPSW(8,0),PSWC01 | LOAD TIMER NEW PSW         |
| 0051D2 | 02 03 F 518 F 500 |      | MVC | TIMWD1(4),TFMSD1   | LOAD TIMER WORD WITH FFF   |
| 0051D8 | 41 7 0 F 518      |      | LA  | R7,TIMWD1          | SET UP TIMER CONTROL WORD  |
| 0051DC | 50 7 0 0 190      |      | ST  | R7,TIMSCW(,0)      | STORE TIMER CONTROL WORD   |
| 0051E0 | 80 00 F 580       |      | SSM | INTER3             | ALLOW SEL1, TIME INTERRUPT |
| 0051E4 | 9C 00 0 100       |      | SIO | 256(0)             |                            |
| 0051E8 | 47 F 0 F 1E8      | ZIPJ | BC  | UNCOND,ZIPJ        | LOOP WAITING FOR INTERRUPT |
| 0051EC | 48 C 0 0 1A0      | ZAPK | LH  | R12,416(,0)        | DISPLAY CSW DEVICE STATUS  |
| 0051F0 | 99 00 C 000       |      | HPR | 0(R12)             | SELECTOR1 INTERRUPT FAILED |
| 0051F4 | 80 00 F 574       | ZIPK | SSM | NOINTA             | ALLOW NO INTERRUPTS        |
| 0051F8 | 02 07 F 53C 0 058 |      | MVC | LOOKA(8),OSIPSW(0) | CALL UP SELECTOR1 OLD PSW  |
| 0051FE | 58 6 0 F 580      |      | L   | R6,CONST5          | LOAD REG 6 WITH MASK WORD  |
| 005202 | 54 6 0 F 540      |      | N   | R6,LOOK1A          | CHECK OLD PSW COND CODE    |
| 005206 | 47 8 0 F 212      |      | BC  | 8,ZIPL             | BRANCH IF COND CODE EQU 0  |
| 00520A | 48 C 0 0 059      | ZAPL | LH  | R12,89(,0)         | DISPLAY SEL1 OLD PSW CC    |
| 00520E | 99 00 C 000       |      | HPR | 0(R12)             | CONDITION CODE NOT ZERO    |
| 005212 | 07 07 F 54C F 50C | ZIPL | XC  | STORE8(8),DATA3A   | COMPARE INPUT WITH OUTPUT  |

|        |                   |       |     |                    |                            |
|--------|-------------------|-------|-----|--------------------|----------------------------|
| 005218 | 47 8 0 F 224      |       | BC  | 8,ZIPM             | BRANCH IF DATA IS EQUAL    |
| 00521C | 48 C 0 F 54C      | ZAPM  | LH  | R12,STORE8         | DISPLAY INPUT DATA         |
| 005220 | 99 00 C 000       |       | HPR | 0(R12)             | INPUT NOT EQUAL TO OUTPUT  |
| 005224 | 58 8 0 F 570      | ZIPM  | L   | R8,TWO0A           | LOAD REG8 WITH CONSTANT 2  |
| 005228 | D2 03 F 560 F 600 |       | MVC | FLAG(4),ZERSA      | CLEAR FLAG STORAGE AREA    |
| 00522E | 41 0 0 F 51C      | ZIPN  | LA  | R0,CCCCW4          | SET UP COM CHAINING CAM    |
| 005232 | 5A 0 0 F 500      |       | A   | R0,TSTBIT          | SET TESTER BIT             |
| 005236 | 41 7 0 F 510      |       | LA  | R7,DATA4A          | SET UP COM CHAIN 1ST CCW   |
| 00523A | 5A 7 0 F 594      |       | A   | R7,COMC06          | SET COMMAND CODE OF WRITE  |
| 00523E | 50 7 0 F 51C      |       | ST  | R7,CCCCW4          |                            |
| 005242 | D2 03 F 520 F 5B4 |       | MVC | CCWC04(4),EIGHT4   | SET UP FOR EIGHT BYTES     |
| 005248 | 41 7 0 F 514      |       | LA  | R7,DATA5A          | SET UP COM CHAIN 2ND CCW   |
| 00524C | 5A 7 0 F 594      |       | A   | R7,COMC06          | SET COMMAND CODE OF WRITE  |
| 005250 | 50 7 0 F 524      |       | ST  | R7,CCCCW5          |                            |
| 005254 | D2 03 F 528 F 5B4 |       | MVC | CCWC05(4),EIGHT4   | SET UP FOR EIGHT BYTES     |
| 00525A | 41 7 0 F 50C      |       | LA  | R7,DATA3A          | SET UP COM CHAIN 3RD CCW   |
| 00525E | 5A 7 0 F 594      |       | A   | R7,COMC06          | SET COMMAND CODE OF WRITE  |
| 005262 | 50 7 0 F 52C      |       | ST  | R7,CCCCW6          |                            |
| 005266 | D2 03 F 530 F 56C |       | MVC | CCWC06(4),EIGHT    | SET UP FOR EIGHT BYTES     |
| 00526C | 41 7 0 F 28C      |       | LA  | R7,ZIPP            | SET UP EIGHT PSW (SEL)     |
| 005270 | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 005274 | D2 07 0 0D8 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 00527A | 41 7 0 F 2A2      |       | LA  | R7,ZAPN            | SET UP NINTH PSW (TIMER)   |
| 00527E | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 005282 | D2 07 0 0A8 F 534 |       | MVC | NTMPSW(8,0),PSWC01 | LOAD TIMER NEW PSW         |
| 005288 | D2 03 F 518 F 500 |       | MVC | TIMWD1(4),TFMSD1   | LOAD TIMER WORD WITH FFF   |
| 00528E | 41 7 0 F 518      |       | LA  | R7,TIMWD1          | SET UP TIMER CONTROL WORD  |
| 005292 | 50 7 0 0 190      |       | ST  | R7,TIMSCW(,0)      | STORE TIMER CONTROL WORD   |
| 005296 | 80 00 F 580       |       | SSM | INTER3             | ALLOW SEL1, TIME INTERRUPT |
| 00529A | 9C 00 0 100       |       | SIO | 256(0)             |                            |
| 00529E | 47 F 0 F 29E      | ZIPO  | BC  | UNCOND,ZIPO        | LOOP WAITING FOR INTERRUPT |
| 0052A2 | 48 C 0 0 1A0      | ZAPN  | LH  | R12,416(,0)        | DIAPLAY CSW DEVICE STATUS  |
| 0052A6 | D7 03 F 560 F 600 |       | XC  | FLAG(4),ZERSA      | IS THIS 1ST OR 2ND TIME    |
| 0052AC | 47 8 0 F 288      |       | BC  | 8,ZAPNA            | BRANCH IF 1ST TIME         |
| 0052B0 | 99 00 C 000       | ZAPNB | HPR | 0(R12)             | SEL1 COM CHAIN FAILED 2ND  |
| 0052B4 | 47 F 0 F 28C      |       | BC  | UNCOND,ZIPP        |                            |
| 0052B8 | 99 00 C 000       | ZAPNA | HPR | 0(R12)             | SEL1 COM CHAIN FAILED 1ST  |
| 0052BC | D2 07 F 53C 0 058 | ZIPP  | MVC | LOOKA(8),OS1PSW(0) | CALL UP SELECTOR1 OLD PSW  |
| 0052C2 | 58 6 0 F 580      |       | L   | R6,CONST5          | LOAD REG 6 WITH MASK WORD  |
| 0052C6 | 54 6 0 F 540      |       | N   | R6,LOOK1A          | CHECK SEL1 OLD PSW CC      |
| 0052CA | 47 8 0 F 2E8      |       | BC  | 8,ZIPQ             | BRANCH IF COND CODE EQU 0  |
| 0052CE | 48 C 0 0 059      | ZAPO  | LH  | R12,89(,0)         | DISPLAY SEL 1 OLD PSW CC   |
| 0052D2 | D7 03 F 560 F 600 |       | XC  | FLAG(4),ZERSA      | IS THIS 1ST OR 2ND TIME    |
| 0052D8 | 47 8 0 F 2E4      |       | BC  | 8,ZAPOA            | BRANCH IF 1ST TIME         |

|        |                   |       |     |                    |                            |
|--------|-------------------|-------|-----|--------------------|----------------------------|
| 00520C | 99 00 C 000       | ZAPOB | HPR | O(R12)             | INCORRECT CC SECOND TIME   |
| 0052E0 | 47 F 0 F 2E8      |       | BC  | UNCOND,ZIPQ        |                            |
| 0052E4 | 99 00 C 000       | ZAPOA | HPR | O(R12)             | INCORRECT CC FIRST TIME    |
| 0052E8 | 07 03 F 550 F 510 | ZIPQ  | XC  | STORE9(4),DATA4A   | CHK FIRST COM CHAIN DATA   |
| 0052EE | 47 8 0 F 30C      |       | BC  | 8,ZIPR             | BRANCH IF DATA IS CORRECT  |
| 0052F2 | 48 C 0 F 550      | ZAPP  | LH  | R12,STORE9         | DISPLAY FIRST INPUT DATA   |
| 0052F6 | 07 03 F 560 F 600 |       | XC  | FLAG(4),ZERSA      | IS THIS 1ST OR 2ND TIME    |
| 0052FC | 47 8 0 F 308      |       | BC  | 8,ZAPPA            | BRANCH IF 1ST TIME         |
| 005300 | 99 00 C 000       | ZAPPB | HPR | O(R12)             | 1ST COM CHAIN DATA BAD 2   |
| 005304 | 47 F 0 F 30C      |       | BC  | UNCOND,ZIPR        |                            |
| 005308 | 99 00 C 000       | ZAPPA | HPR | O(R12)             | 1ST COM CHAIN DATA BAD 1   |
| 00530C | 07 03 F 554 F 514 | ZIPR  | XC  | STOREA(4),DATA5A   | CHK SECOND COM CHAIN DATA  |
| 005312 | 47 8 0 F 330      |       | BC  | 8,ZIPS             | BRANCH IF DATA IS CORRECT  |
| 005316 | 48 C 0 F 554      | ZAPQ  | LH  | R12,STOREA         | DISPLAY SECOND INPUT DATA  |
| 00531A | 07 03 F 560 F 600 |       | XC  | FLAG(4),ZERSA      | IS THIS 1ST OR 2ND TIME    |
| 005320 | 47 8 0 F 32C      |       | BC  | 8,ZAPQA            | BRANCH IF 1ST TIME         |
| 005324 | 99 00 C 000       | ZAPQB | HPR | O(R12)             | 2ND COM CHAIN DATA BAD 2   |
| 005328 | 47 F 0 F 330      |       | BC  | UNCOND,ZIPS        |                            |
| 00532C | 99 00 C 000       | ZAPQA | HPR | O(R12)             | 2ND COM CHAIN DATA BAD 1   |
| 005330 | 02 13 F 544 F 600 | ZIPS  | MVC | STORE6(20),ZERSA   | CLEAR STORAGE AREAS        |
| 005336 | 02 03 F 560 F 5AC |       | MVC | FLAG(4),CONST4     | SET FLAG TO SHOW NO.2      |
| 00533C | 46 8 0 F 22E      |       | BCT | R8,ZIPN            | REPEAT COM CHAIN TEST      |
| 005340 | 41 7 0 F 374      |       | LA  | R7,ZIPU            | SET UP TENTH PSW (SEL)     |
| 005344 | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 005348 | 02 07 0 0D8 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 00534E | 41 0 0 F 558      |       | LA  | R0,CCWC01          | SET UP FOURTH CAW          |
| 005352 | 5A 0 0 F 500      |       | A   | R0,TSTBIT          | SET TESTER BIT             |
| 005356 | 41 7 0 F 544      |       | LA  | R7,STORE6          | SET UP FOURTH CCW          |
| 00535A | 5A 7 0 F 58C      |       | A   | R7,COMC05          | SET COMMAND CODE OF READ   |
| 00535E | 50 7 0 F 558      |       | ST  | R7,CCWC01          |                            |
| 005362 | 02 03 F 55C F 56C |       | MVC | CCWC03(4),EIGHT    | SET UP FOR EIGHT BYTES     |
| 005368 | 80 00 F 578       |       | SSM | INTER1             | ALLOW SELECTOR 1 INTERRUPT |
| 00536C | 9C 00 0 100       |       | SIO | Z56(0)             |                            |
| 005370 | 47 F 0 F 370      | ZIPT  | BC  | UNCOND,ZIPT        | LOOP WAITING FOR INTERRUPT |
| 005374 | 02 01 F 53C 0 1A0 | ZIPU  | MVC | LOOKA(2),SO1CSW(0) | CALL UP SELECTOR 1 CSW     |
| 00537A | 07 01 F 53C F 5BC |       | XC  | LOOKA(2),COMST3    | COMPARE SELECTOR CSW       |
| 005380 | 47 8 0 F 38C      |       | BC  | 8,ZIPV             | BRANCH IF CORRECT          |
| 005384 | 48 C 0 0 1A0      | ZAPR  | LH  | R12,SO1CSW(,0)     | DISPLAY SELECTOR 1 CSW     |
| 005388 | 99 00 C 000       |       | HPR | O(R12)             | IMPROPER SEL CSW FOR READ  |
| 00538C | 41 7 0 F 3C0      | ZIPV  | LA  | R7,ZIPX            | SET UP ELEVENTH PSW (SEL)  |
| 005390 | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 005394 | 02 07 0 0D8 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 00539A | 41 0 0 F 558      |       | LA  | R0,CCWC01          | SET UP FIFTH CAW           |
| 00539E | 5A 0 0 F 500      |       | A   | R0,TSTBIT          | SET TESTER BIT             |

|        |                   |       |     |                    |                            |
|--------|-------------------|-------|-----|--------------------|----------------------------|
| 0053A2 | 41 7 0 F 508      |       | LA  | R7,DATA2A          | SET UP FIFTH CCW           |
| 0053A6 | 5A 7 0 F 594      |       | A   | R7,COMC06          | SET COMMAND CODE OF WRITE  |
| 0053AA | 50 7 0 F 558      |       | ST  | R7,CCWC01          |                            |
| 0053AE | 02 03 F 55C F 56C |       | MVC | CCWC03(4),EIGHT    | SET UP FOR EIGHT BYTES     |
| 0053B4 | 80 00 F 578       |       | SSM | INTER1             | ALLOW SELECTOR 1 INTERRUPT |
| 0053B8 | 9C 00 0 100       |       | SIO | 256(0)             |                            |
| 0053BC | 47 F 0 F 38C      | ZIPW  | BC  | UNCOND,ZIPW        | LOOP WAITING FOR INTERRUPT |
| 0053C0 | 02 01 F 53C 0 1A0 | ZIPX  | MVC | LOOKA(2),SO1CSW(0) | CALL UP SELECTOR1 CSW      |
| 0053C6 | 07 01 F 53C F 588 |       | XC  | LOOKA(2),COMST1    | COMPARESELECTOR CSW        |
| 0053CC | 47 8 0 F 308      |       | BC  | 8,ZIPY             | BRANCH IF CORRECT          |
| 0053D0 | 48 C 0 0 1A0      | ZAPS  | LH  | R12,SO1CSW(,0)     | DISPLAY SELECTOR 1 CSW     |
| 0053D4 | 99 00 C 000       |       | HPR | 0(R12)             | IMPROPER CSW FOR WRITE     |
| 0053D8 | 41 7 0 F 40C      | ZIPY  | LA  | R7,ZIPAA           | SET UP TEWLFTH PSW (SEL)   |
| 0053DC | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 0053E0 | 02 07 0 008 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 0053E6 | 41 0 0 F 558      |       | LA  | R0,CCWC01          | SET UP SIXTH CAW           |
| 0053EA | 5A 0 0 F 500      |       | A   | R0,TSTBIT          | SET TESTER BIT             |
| 0053EE | 41 7 0 F 54C      |       | LA  | R7,STORE8          | SET UP SIXTH CCW           |
| 0053F2 | 5A 7 0 F 59C      |       | A   | R7,COMC07          | SET COMMAND CODE OF SENSE  |
| 0053F6 | 50 7 0 F 558      |       | ST  | R7,CCWC01          |                            |
| 0053FA | 02 03 F 55C F 56C |       | MVC | CCWC03(4),EIGHT    | SET UP FOR EIGHT BYTES     |
| 005400 | 80 00 F 578       |       | SSM | INTER1             | ALLOW SELECTOR 1 INTERRUPT |
| 005404 | 9C 00 0 100       |       | SIO | 256(0)             |                            |
| 005408 | 47 F 0 F 408      | ZIPZ  | BC  | UNCOND,ZIPZ        | LOOP WAITING FOR INTERRUPT |
| 00540C | 02 01 F 53C 0 1A0 | ZIPAA | MVC | LOOKA(2),SO1CSW(0) | CALL UP SELECTOR1 CSW      |
| 005412 | 07 01 F 53C F 5C0 |       | XC  | LOOKA(2),COMST5    | COMPARE SELECTOR1 CSW      |
| 005418 | 47 8 0 F 424      |       | BC  | 8,ZIPBB            | BRANCH IF CORRECT          |
| 00541C | 48 C 0 0 1A0      | ZAPT  | LH  | R12,SO1CSW(,0)     | DISPLAY SELECTOR 1 CSW     |
| 005420 | 99 00 C 000       |       | HPR | 0(R12)             | IMPROPER SEL CSW ON SENSE  |
| 005424 | 41 7 0 F 458      | ZIPBB | LA  | R7,ZIPDD           | SET UP THIRINTH PSW (SEL)  |
| 005428 | 50 7 0 F 538      |       | ST  | R7,PSWC03          |                            |
| 00542C | 02 07 0 008 F 534 |       | MVC | NS1PSW(8,0),PSWC01 | LOAD SELECTOR 1 NEW PSW    |
| 005432 | 41 0 0 F 558      |       | LA  | R0,CCWC01          | SET UP SEVENTH CAW         |
| 005436 | 5A 0 0 F 500      |       | A   | R0,TSTBIT          | SET TESTER BIT             |
| 00543A | 41 7 0 F 510      |       | LA  | R7,DATA4A          | SET UP SEVENTH CCW         |
| 00543E | 5A 7 0 F 5A4      |       | A   | R7,COMC08          | SET COM CODE FOR RD BKWRD  |
| 005442 | 50 7 0 F 558      |       | ST  | R7,CCWC01          |                            |
| 005446 | 02 03 F 55C F 56C |       | MVC | CCWC03(4),EIGHT    | SET UP FOR EIGHT BYTES     |
| 00544C | 80 00 F 578       |       | SSM | INTER1             | ALLOW SELECTOR 1 INTERRUPT |
| 005450 | 9C 00 0 100       |       | SIO | 256(0)             |                            |
| 005454 | 47 F 0 F 454      | ZIPCC | BC  | UNCOND,ZIPCC       | LOOP WAITING FOR INTERRUPT |
| 005458 | 02 01 F 53C 0 1A0 | ZIPDD | MVC | LOOKA(2),SO1CSW(0) | CALL UP SELECTOR1 CSW      |
| 00545E | 07 01 F 53C F 5C4 |       | XC  | LOOKA(2),COMST7    | COMPARE SELECTOR CSW       |
| 005464 | 47 8 0 F 470      |       | BC  | 8,ZIPEE            | BRANCH IF CORRECT          |

|        |              |        |      |                |                           |
|--------|--------------|--------|------|----------------|---------------------------|
| 005468 | 48 C 0 0 1A0 | ZAPU   | LH   | R12,SU1CSW(,0) | DISPLAY SELECTOR 1 CSW    |
| 00546C | 99 00 C 000  |        | HPR  | 0(R12)         | IMPROPER CSW FOR RD BKWRD |
| 005470 | 82 00 F 5FR  | ZIPEE  | LPSW | LABELA         | RETURN TO EXEC            |
|        | 005500       |        | ORG  | \$SELONE+1280  | SET ADDRESS TO HEX 5500   |
| 005500 | 00800000     | TSTBIT | DC   | X'00800000'    | USED TO SET TESTER BIT    |
| 005504 | 0FF0AA55     | DATA1A | DC   | X'0FF0AA55'    | DATA FOR TRANSFER         |
| 005508 | 00FF00FF     | DATA2A | DC   | X'00FF00FF'    |                           |
| 00550C | 55AA55AA     | DATA3A | DC   | X'55AA55AA'    |                           |
| 005510 | 1C1C1C1C     | DATA4A | DC   | X'1C1C1C1C'    |                           |
| 005514 | E3E3E3E3     | DATA5A | DC   | X'E3E3E3E3'    |                           |
| 005518 | 00000000     | TIMWD1 | DC   | F'0'           | TIMER WRD FOR CONTROL WRD |
| 00551C | 00000000     | CCCCW4 | DC   | F'0'           | FIRST COMMAND CHAIN CCW   |
| 005520 | 00000000     | CCWC04 | DC   | F'0'           |                           |
| 005524 | 00000000     | CCCCW5 | DC   | F'0'           | SECOND COMMAND CHAIN CCW  |
| 005528 | 00000000     | CCWC05 | DC   | F'0'           |                           |
| 00552C | 00000000     | CCCCW6 | DC   | F'0'           | THIRD COMMAND CHAIN CCW   |
| 005530 | 00000000     | CCWC06 | DC   | F'0'           |                           |
| 005534 | 00000000     | PSWC01 | DC   | F'0'           | STORAGE FOR SETTING PSW   |
| 005538 | 00000000     | PSWC03 | DC   | F'0'           |                           |
| 00553C | 00000000     | LOOKA  | DC   | F'0'           | STORAGE FOR OLDPSW CALLUP |
| 005540 | 00000000     | LOOK1A | DC   | F'0'           |                           |
| 005544 | 00000000     | STORE6 | DC   | F'0'           | STORAGE FOR DATA TRANSFER |
| 005548 | 00000000     | STORE7 | DC   | F'0'           |                           |
| 00554C | 00000000     | STORE8 | DC   | F'0'           |                           |
| 005550 | 00000000     | STORE9 | DC   | F'0'           |                           |
| 005554 | 00000000     | STOREA | DC   | F'0'           |                           |
| 005558 | 00000000     | CCWC01 | DC   | F'0'           | STORAGE FOR SETTING CCW   |
| 00555C | 00000000     | CCWC03 | DC   | F'0'           |                           |
| 005560 | 00000000     | FLAG   | DC   | F'0'           |                           |
| 005564 | 00000000     | CONST6 | DC   | F'0'           | VARIABLE MASK WORD        |
| 005568 | 00000000     | TIMTC1 | DC   | F'0'           | TIMER CONTROL WORD        |
| 00556C | 00000008     | EIGHT  | DC   | F'8'           | CONSTANT OF EIGHT         |
| 005570 | 00000002     | TWO0A  | DC   | F'2'           | CONSTANT OF TWO           |
| 005574 | 00000000     | NOINTA | DC   | F'0'           | NO INTERRUPTS             |
| 005578 | 20000000     | INTER1 | DC   | X'20000000'    | SELECTOR 1 INTERRUPT      |
| 00557C | 10000000     | INTER2 | DC   | X'10000000'    | SELECTOR 2 INTERRUPT      |
| 005580 | 60000000     | INTER3 | DC   | X'60000000'    | SEL1 & TIMER INTERRUPTS   |
| 005584 | 40000000     | INTER4 | DC   | X'40000000'    | TIMER INTERRUPT           |
| 005588 | 50000000     | INTER5 | DC   | X'50000000'    | SEL2 & TIMER INTERRUPTS   |
| 00558C | 02000000     | COMC05 | DC   | X'02000000'    | FIRST SELECTOR CSW READ   |
| 005590 | 08000000     |        | DC   | X'08000000'    |                           |
| 005594 | 01000000     | COMC06 | DC   | X'01000000'    | SECOND SELECTOR CSW WRITE |
| 005598 | 08000000     |        | DC   | X'08000000'    |                           |
| 00559C | 04000000     | COMC07 | DC   | X'04000000'    | THIRD SELECTOR CSW SENSE  |

```

0055A0 08000000
0055A4 0C000000
0055A8 08000000
0055AC FF000000
0055B0 30000000
0055B4 40000008
0055B8 01000000
0055BC 02000000
0055C0 04000000
0055C4 0C000000
0055C8 00100000
0055CC 00000FFF
0055D0 FFF00000
0055D4 00000001
0055D8 08000000
0055DC 00005022
0055E0 0002
0055E2 55E4
0055E4 0080
0055E6 55E8
0055E8 0025
0055EA E2C5D3F1
0055EE 0025
0055F0 0080
0055F2 55E8
0055F4 0700 0700
0055F8 38000000 00000214
005600 00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
005000

```

```

COMC08 DC X'08000000'
DC X'0C000000'
DC X'08000000'
CONST4 DC X'FF000000'
CONST5 DC X'30000000'
EIGHT4 DC X'40000008'
COMST1 DC X'01000000'
COMST3 DC X'02000000'
COMST5 DC X'04000000'
COMST7 DC X'0C000000'
WONMS1 DC X'00100000'
BIGONE DC X'00000FFF'
TFMSD1 DC X'FFF00000'
MSG DC F'1'
MSGPSW DC X'08000000'
DC A(BEGIN1)
DC X'0002'
DC Y(MSGBCW)
MSGBCW DC X'0080'
DC Y(COMMSG)
COMMSG DC X'0025'
DC C'SEL1'
DC X'0025'
MSGCON DC X'0080'
DC Y(COMMSG)
DC 0,8
CNOP
LABELA DC X'3800000000000214'
ZERSA DC 14F'0'

```

END

SSELONE

FOURTH SEL CSW RD BKWRD

```

FIRST MASK WORD
SECOND MASK WORD
EIGHT BYTES FOR COM CHAIN
COMMAND CODE FOR WRITE
COMMAND CODE FOR READ
COMMAND CODE FOR SENSE
COMMAND CODE FOR RD BKWRD
1MS COUNT FOR TIMER
COUNT FOR BCT
4 SECOND DELAY

```

CONSTANTS OF ZERO



|        | \$SELTWO | START<br>USING | 20480<br>*,15 |
|--------|----------|----------------|---------------|
| 000001 | B1       | EQU            | 1             |
| 000002 | B2       | EQU            | 2             |
| 000003 | B3       | EQU            | 3             |
| 000004 | B4       | EQU            | 4             |
| 000005 | B5       | EQU            | 5             |
| 000006 | B6       | EQU            | 6             |
| 000007 | B7       | EQU            | 7             |
| 000008 | B8       | EQU            | 8             |
| 000009 | B9       | EQU            | 9             |
| 00000A | B10      | EQU            | 10            |
| 00000B | B11      | EQU            | 11            |
| 00000C | B12      | EQU            | 12            |
| 00000D | B13      | EQU            | 13            |
| 00000E | B14      | EQU            | 14            |
| 00000F | B15      | EQU            | 15            |
| 000000 | R0       | EQU            | 0             |
| 000001 | R1       | EQU            | 1             |
| 000002 | R2       | EQU            | 2             |
| 000003 | R3       | EQU            | 3             |
| 000004 | R4       | EQU            | 4             |
| 000005 | R5       | EQU            | 5             |
| 000006 | R6       | EQU            | 6             |
| 000007 | R7       | EQU            | 7             |
| 000008 | R8       | EQU            | 8             |
| 000009 | R9       | EQU            | 9             |
| 00000A | R10      | EQU            | 10            |
| 00000B | R11      | EQU            | 11            |
| 00000C | R12      | EQU            | 12            |
| 00000D | R13      | EQU            | 13            |
| 00000E | R14      | EQU            | 14            |
| 00000F | R15      | EQU            | 15            |

| EJECT  |        |     |        |
|--------|--------|-----|--------|
| 000000 | S0ABS  | EQU | 0      |
| 000010 | S1ABS  | EQU | 16     |
| 000020 | S2ABS  | EQU | 32     |
| 000030 | S3ABS  | EQU | 48     |
| 000040 | S4ABS  | EQU | 64     |
| 000050 | S5ABS  | EQU | 80     |
| 000060 | S6ABS  | EQU | 96     |
| 000070 | S7ABS  | EQU | 112    |
| 000080 | S8ABS  | EQU | 128    |
| 000090 | S9ABS  | EQU | 144    |
| 0000A0 | S10ABS | EQU | 160    |
| 0000B0 | S11ABS | EQU | 176    |
| 0000C0 | S12ABS | EQU | 192    |
| 0000D0 | S13ABS | EQU | 208    |
| 0000E0 | S14ABS | EQU | 224    |
| 0000F0 | S15ABS | EQU | 240    |
| 000190 | TIMSCW | EQU | 400    |
| 0001A8 | S02CSW | EQU | 424    |
| 000008 | OSVPSW | EQU | X'008' |
| 000018 | OPRPSW | EQU | X'018' |
| 000028 | OTMPSW | EQU | X'028' |
| 000038 | OMSPSW | EQU | X'038' |
| 000048 | OMNPSW | EQU | X'048' |
| 000058 | OS1PSW | EQU | X'058' |
| 000068 | OS2PSW | EQU | X'068' |
| 000078 | ONUPSW | EQU | X'078' |
| 000088 | NSVPSW | EQU | X'088' |
| 000098 | NPRPSW | EQU | X'098' |
| 0000A8 | NTMPSW | EQU | X'0A8' |
| 0000B8 | NMSPSW | EQU | X'0B8' |
| 0000C8 | NMNPSW | EQU | X'0C8' |
| 0000D8 | NS1PSW | EQU | X'0D8' |
| 0000E8 | NS2PSW | EQU | X'0E8' |
| 000114 | IPLBCW | EQU | X'114' |
| 000190 | TCW    | EQU | X'190' |
| 0001A0 | CSW1   | EQU | X'1A0' |
| 0001A8 | CSW2   | EQU | X'1A8' |
| 000008 | ZERO   | EQU | 8      |
| 000007 | NONZ   | EQU | 7      |

|           |                   |        |     |                    |
|-----------|-------------------|--------|-----|--------------------|
| 000004    | LSZ               | EQU    | 4   |                    |
| 00000C    | LEZ               | EQU    | 12  |                    |
| 000002    | GTZ               | EQU    | 2   |                    |
| 00000A    | GEZ               | EQU    | 10  |                    |
| 000008    | EQL               | EQU    | 8   |                    |
| 000007    | NEQ               | EQU    | 7   |                    |
| 00000F    | UNCOND            | EQU    | 15  |                    |
| 000004    | MIXED             | EQU    | 4   |                    |
| 000001    | ONES              | EQU    | 1   |                    |
| 00000E    | NONES             | EQU    | 14  |                    |
| * * * * * |                   |        |     |                    |
| 005000    | 58 F 0 0 050      | MESAG2 | L   | R15,SSABS(,0)      |
| 005004    | D2 03 F 5E4 F 5F0 |        | MVC | MSSBCW(4),MSSCON   |
| 00500A    | 80 00 F 508       |        | SSM | MSSPSW             |
| 00500E    | 98 0 3 F 5D4      |        | LM  | R0,R3,MSGA         |
| 005012    | 90 1 2 0 088      |        | STM | R1,R2,NMSPSW(0)    |
| 005016    | 50 3 0 0 100      |        | ST  | R3,256(,0)         |
| 00501A    | 9C 00 0 080       |        | SIO | 128(0)             |
| 00501E    | 47 F 0 F 01E      |        | BC  | 15,*               |
| 005022    | 58 1 0 0 010      |        | L   | R1,SIABS(,0)       |
| 005026    | D2 03 0 0C0 F 600 | BEGIN2 | MVC | S12ABS(4,0),ZERS   |
| 00502C    | 58 8 0 F 5CC      |        | L   | R8,BIGTWO          |
| 005030    | D2 37 0 088 F 600 |        | MVC | NSVPSW(56,0),ZERS  |
| 005036    | 41 7 0 F 05E      |        | LA  | R7,ZIPPR2          |
| 00503A    | 50 7 0 F 538      |        | ST  | R7,PSWC02          |
| 00503E    | D2 07 0 0A8 F 534 |        | MVC | NTMPSW(8,0),PSWCON |
| 005044    | D2 03 F 518 F 5C8 |        | MVC | TIMEND(4),WONMS2   |
| 00504A    | 41 7 0 F 518      |        | LA  | R7,TIMEND          |
| 00504E    | 50 7 0 0 190      |        | ST  | R7,TIMSCW(,0)      |
| 005052    | 80 00 F 584       |        | SSM | TIMINT             |
| 005056    | 46 8 0 F 056      | ZIPPPR | BCT | R8,ZIPPPR          |
| 00505A    | 99 00 0 000       |        | HPR | 0(R0)              |
| 00505E    | D2 18 F 534 F 600 | ZIPPR2 | MVC | PSWCON(28),ZERS    |
| 005064    | 41 7 0 F 096      |        | LA  | R7,ZAP1            |
| 005068    | 50 7 0 F 538      |        | ST  | R7,PSWC02          |
| 00506C    | D2 07 0 0E8 F 534 |        | MVC | NS2PSW(8,0),PSWCON |
| 005072    | 41 7 0 F 504      |        | LA  | R7,DATA1           |
| 005076    | 5A 7 0 F 594      |        | A   | R7,COMC02          |
| 00507A    | 50 7 0 F 558      |        | ST  | R7,CCWCON          |
| 00507E    | D2 03 F 55C F 56C |        | MVC | CCWC02(4),EIGHT8   |
| 005084    | 41 0 0 F 558      |        | LA  | R0,CCWCON          |
| 005088    | D2 07 0 1A8 F 600 |        | MVC | S02CSW(8,0),ZERS   |
| 00508E    | 80 00 F 57C       |        | SSM | SELZIN             |
| 005092    | 47 F 0 F 09A      |        | BC  | UNCOND,ZIP1        |

USED FOR ALIGNMENT  
CLEAR REGISTER TWELVE

CLEAR NEW PSW LOCATIONS  
SET UP TIMER NEW PSW

LOAD TIMER WITH IMS CNT

ALLOW TIMER INTERRUPT  
WAIT FOR TIMER INTERRUPT  
TIMER DISABLED  
CLEAR STORAGE AREAS  
SET UP FIRST PSW (SEL)

LOAD SELECTOR 2 NEW PSW  
SET UP FIRST CCW  
SET COMMAND CODE OF WRITE

SET UP FOR EIGHT BYTES  
SET UP FIRST CAW  
CLEAR SELECTOR 2 CSW  
ALLOW SELECTOR 2 INTERRUPT  
BRANCH IF NO INTERRUPT

|        |                   |      |     |                    |                            |
|--------|-------------------|------|-----|--------------------|----------------------------|
| 005096 | 99 00 0 000       | ZAP1 | HPR | 0(R0)              | INTERUPT WITHOUT SIO       |
| 00509A | 58 7 0 F 600      | ZIP1 | L   | R7,ZERS            | CLEAR REGISTER 7 FOR COMP  |
| 00509E | 57 7 0 0 1A8      |      | X   | R7,S02CSW(,0)      | CHECK SEL 2 CSW FOR ZEROS  |
| 0050A2 | 47 8 0 F 0AE      |      | BC  | 8,ZIP2             | BRANCH IF ZERO             |
| 0050A6 | 48 C 0 0 1A8      | ZAP2 | LH  | R12,S02CSW(,0)     | DISPLAY SEL 2 CSW          |
| 0050AA | 99 00 C 000       |      | HPR | 0(R12)             | SEL 2 CSW NOT CLEARED      |
| 0050AE | 41 7 0 F 0C4      | ZIP2 | LA  | R7,ZAP3            | SET UP SECOND PSW (SEL)    |
| 0050B2 | 50 7 0 F 538      |      | ST  | R7,PSWC02          |                            |
| 0050B6 | 02 07 0 0E8 F 534 |      | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 0050BC | 9C 00 0 200       |      | SIO | 512(0)             |                            |
| 0050C0 | 47 1 0 F 0D8      |      | BC  | 1,ZIP3             | BRANCH IF COND CODE EQU 3  |
| 0050C4 | 48 C 0 0 06B      | ZAP3 | LH  | R12,107(,0)        | DISPLAY CONDITION CODE     |
| 0050C8 | 99 00 C 000       |      | HPR | 0(R12)             | INCORRECT CONDITION CODE   |
| 0050CC | 47 F 0 F 0D8      |      | BC  | UNCOND,ZIP3        | RETURN TO PROGRAM          |
| 0050D0 | 48 C 0 0 1A8      | ZAP4 | LH  | R12,424(,0)        | DISPLAY DEVICE STATUS      |
| 0050D4 | 99 00 C 000       |      | HPR | 0(R12)             | INTER W/O DEVICE OR TESTR  |
| 0050D8 | 80 00 F 574       | ZIP3 | SSM | NOINT              | ALLOW NO INTERRUPTS        |
| 0050DC | 41 7 0 F 10C      |      | LA  | R7,ZAP5            | SET UP THIRD PSW (SEL)     |
| 0050E0 | 50 7 0 F 538      |      | ST  | R7,PSWC02          |                            |
| 0050E4 | 02 07 0 0E8 F 534 |      | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 0050EA | 41 0 0 F 558      |      | LA  | R0,CCWCON          | SET UP SECOND CAW          |
| 0050EE | 5A 0 0 F 500      |      | A   | R0,TESTBT          | SET TESTER BIT             |
| 0050F2 | 41 7 0 F 504      |      | LA  | R7,DATA1           | SET UP SECOND CCW          |
| 0050F6 | 5A 7 0 F 594      |      | A   | R7,COMC02          | SET COMMAND CODE OF WRITE  |
| 0050FA | 50 7 0 F 558      |      | ST  | R7,CCWCON          |                            |
| 0050FE | 02 03 F 55C F 56C |      | MVC | CCWC02(4),EIGHT8   | SET UP FOR EIGHT BYTES     |
| 005104 | 80 00 F 57C       |      | SSM | SEL2IN             | ALLOW SELECTOR 2 INTERRUPT |
| 005108 | 47 F 0 F 114      |      | BC  | UNCOND,ZIP4        | BRANCH IF NO INTERRUPT     |
| 00510C | 48 C 0 0 069      | ZAP5 | LH  | R12,105(,0)        | DISPLAY PSW INTERRUPT CODE |
| 005110 | 99 00 C 000       |      | HPR | 0(R12)             | INT W/O START I/O          |
| 005114 | 41 7 0 F 158      | ZIP4 | LA  | R7,ZIP6            | SET UP FOURTH PSW (SEL)    |
| 005118 | 50 7 0 F 538      |      | ST  | R7,PSWC02          |                            |
| 00511C | 02 07 0 0E8 F 534 |      | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 005122 | 41 7 0 F 150      |      | LA  | R7,ZAP7            | SET UP FIFTH PSW (TIMER)   |
| 005126 | 50 7 0 F 538      |      | ST  | R7,PSWC02          |                            |
| 00512A | 02 03 0 190 F 500 |      | MVC | TIMSCW(4,0),TESTBT | DISABLE TIMER              |
| 005130 | 02 07 0 0A8 F 534 |      | MVC | NTMPSW(8,0),PSWCON | LOAD TIME NEW PSW          |
| 005136 | 02 03 F 518 F 5D0 |      | MVC | TIMEWD(4),TWFMSD   | LOAD TIMER WORD WITH FFF   |
| 00513C | 41 7 0 F 518      |      | LA  | R7,TIMEWD          | SET UP TIMER CONTROL WORD  |
| 005140 | 50 7 0 0 190      |      | ST  | R7,TIMSCW(,0)      | STORE TIMER CONTROL WORD   |
| 005144 | 80 00 F 588       |      | SSM | TSEL2I             | ALLOW SEL2, TIME INTERRUPT |
| 005148 | 9C 00 0 200       |      | SIO | 512(0)             |                            |
| 00514C | 47 F 0 F 14C      | ZIP5 | BC  | 15,*               | LOOP WAITING FOR INTERRUPT |
| 005150 | 48 C 0 0 1A8      | ZAP7 | LH  | R12,424(,0)        | DISPLAY DEVICE STATUS      |

|        |                   |       |     |                    |                            |
|--------|-------------------|-------|-----|--------------------|----------------------------|
| 005154 | 99 00 C 000       |       | HPR | 0(R12)             | SELECTOR INTERRUPT FAILED  |
| 005158 | D2 07 F 53C 0 068 | ZIP6  | MVC | LOOK(8),052PSW(0)  | CALL UP OLD SELECTOR PSW   |
| 00515E | 58 6 0 F 5B0      |       | L   | R6,CONST2          | LOAD REG6 WITH MASK WORD   |
| 005162 | 54 6 0 F 540      |       | N   | R6,LOOK1           | CHECK OLD SEL2 COND CODE   |
| 005166 | 47 8 0 F 172      |       | BC  | 8,ZIP7             | BRANCH IF COND CODE EQU 0  |
| 00516A | 48 C 0 0 068      | ZAP8  | LH  | R12,107(,0)        | DISPLAY CONDITION CODE     |
| 00516E | 99 00 C 000       |       | HPR | 0(R12)             | CONDITION CODE NOT ZERO    |
| 005172 | D2 01 F 53C 0 1A8 | ZIP7  | MVC | LOOK(2),S02CSW(0)  | CALL SELECTOR 2 CSW        |
| 005178 | D7 01 F 53C F 5B8 |       | XC  | LOOK(2),CONST0     | CHECK SELECTOR 2 CSW       |
| 00517E | 47 8 0 F 18A      |       | BC  | 8,ZIP8             | BRANCH IF CORRECT          |
| 005182 | 48 C 0 0 1A8      | ZAP9  | LH  | R12,424(,0)        | DISPLAY CSW DEVICE STATUS  |
| 005186 | 99 00 C 000       |       | HPR | 0(R12)             | INCORRECT SELECTOR 2 CSW   |
| 00518A | D7 07 F 544 F 504 | ZIP8  | XC  | STORE(8),DATA1     | COMPARE INPUT WITH OUTPUT  |
| 005190 | 47 8 0 F 19C      |       | BC  | 8,ZIP9             | BRANCH IF EQUAL            |
| 005194 | 48 C 0 F 544      | ZAP10 | LH  | R12,STORE1         | DISPLAY FIRST INPUT WORD   |
| 005198 | 99 00 C 000       |       | HPR | 0(R12)             | INPUT NOT EQUAL TO OUTPUT  |
| 00519C | 80 00 F 574       | ZIP9  | SSM | NOINT              | ALLOW NO INTERRUPTS        |
| 0051A0 | 41 7 0 F 1F8      |       | LA  | R7,ZIP11           | SET UP SIXTH PSW (SEL)     |
| 0051A4 | 50 7 0 F 538      |       | ST  | R7,PSWC02          |                            |
| 0051A8 | D2 07 0 0E8 F 534 |       | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 0051AE | 41 0 0 F 558      |       | LA  | R0,CCWCON          | SET UP THIRD CAN           |
| 0051B2 | 5A 0 0 F 500      |       | A   | R0,TESTBT          | SET TESTER BIT             |
| 0051B6 | 41 7 0 F 50C      |       | LA  | R7,DATA3           | SET UP THIRD CCW           |
| 0051BA | 5A 7 0 F 594      |       | A   | R7,COMC02          | SET COMMAND CODE OF WRITE  |
| 0051BE | 50 7 0 F 558      |       | ST  | R7,CCWCON          |                            |
| 0051C2 | D2 03 F 55C F 56C |       | MVC | CCWC02(4),EIGHT8   | SET UP FOR EIGHT BYTES     |
| 0051C8 | 41 7 0 F 1F0      |       | LA  | R7,ZAP11           | SET UP SEVENTH PSW (TIME)  |
| 0051CC | 50 7 0 F 538      |       | ST  | R7,PSWC02          |                            |
| 0051D0 | D2 07 0 0A8 F 534 |       | MVC | NTMPSW(8,0),PSWCON | LOAD TIMER NEW PSW         |
| 0051D6 | D2 03 F 518 F 5D0 |       | MVC | TIMESW(4),TWFMSD   | LOAD TIMER WORD WITH FFF   |
| 0051DC | 41 7 0 F 518      |       | LA  | R7,TIMESW          | SET UP TIMER CONTROL WORD  |
| 0051E0 | 50 7 0 0 190      |       | ST  | R7,TIMESW(,0)      | STORE TIMER CONTROL WORD   |
| 0051E4 | 80 00 F 588       |       | SSM | TSEL21             | ALLOW SEL2, TIME INTERRUPT |
| 0051E8 | 9C 00 0 200       |       | SIO | 512(0)             |                            |
| 0051EC | 47 F 0 F 1EC      | ZIP10 | BC  | 15,*               | LOOP WAITING FOR INTERRUPT |
| 0051F0 | 48 C 0 0 1A8      | ZAP11 | LH  | R12,424(,0)        | DISPLAY CSW DEVICE STATUS  |
| 0051F4 | 99 00 C 000       |       | HPR | 0(R12)             | SEL2 INTERRUPT FAILED      |
| 0051F8 | 80 00 F 574       | ZIP11 | SSM | NOINT              | ALLOW NO INTERRUPTS        |
| 0051FC | D2 07 F 53C 0 068 |       | MVC | LOOK(8),052PSW(0)  | CALL UP SELECTOR OLD PSW   |
| 005202 | 58 6 0 F 5B0      |       | L   | R6,CONST2          | LOAD REG6 WITH MASK WORD   |
| 005206 | 54 6 0 F 540      |       | N   | R6,LOOK1           | CHECK OLD PSW COND CODE    |
| 00520A | 47 8 0 F 216      |       | BC  | 8,ZIP12            | BRANCH IF COND CODE EQU 0  |
| 00520E | 48 C 0 0 069      | ZAP12 | LH  | R12,105(,0)        | DISPLAY SEL2 OLD PSW CC    |
| 005212 | 99 00 C 000       |       | HPR | 0(R12)             | CONDITION CODE NOT ZERO    |

|        |                   |        |     |                    |                            |
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| 005216 | D7 07 F 54C F 50C | ZIP12  | XC  | STORE3(8),DATA3    | COMPARE INPUT WITH OUTPUT  |
| 00521C | 47 8 0 F 228      |        | BC  | 8,ZIP13            | BRANCH IF DATA IS EQUAL    |
| 005220 | 48 C 0 F 54C      | ZAP13  | LH  | R12,STORE3         | DISPLAY INPUT DATA         |
| 005224 | 99 00 C 000       |        | HPR | 0(R12)             | INPUT NOT EQUAL TO OUTPUT  |
| 005228 | 58 8 0 F 570      | ZIP13  | L   | R8,TW00            | LOAD REG8 WITH CONSTANT 2  |
| 00522C | D2 03 F 560 F 600 |        | MVC | FLAP(4),ZERS       | CLEAR FLAG STORAGE AREAS   |
| 005232 | 41 0 0 F 51C      | ZIP14  | LA  | R0,CCCCW1          | SET UP COM CHAINING CAW    |
| 005236 | 5A 0 0 F 500      |        | A   | R0,TESTBT          | SET TESTER BIT             |
| 00523A | 41 7 0 F 510      |        | LA  | R7,DATA4           | SET UP COM CHAIN 1ST CCW   |
| 00523E | 5A 7 0 F 594      |        | A   | R7,COMC02          | SET COMMAND CODE OF WRITE  |
| 005242 | 50 7 0 F 51C      |        | ST  | R7,CCCCW1          |                            |
| 005246 | D2 03 F 520 F 584 |        | MVC | CCWCC1(4),EIGHT9   | SET UP FOR EIGHT BYTES     |
| 00524C | 41 7 0 F 514      |        | LA  | R7,DATA5           | SET UP COM CHAIN 2ND CCW   |
| 005250 | 5A 7 0 F 594      |        | A   | R7,COMC02          | SET COMMAND CODE OF WRITE  |
| 005254 | 50 7 0 F 524      |        | ST  | R7,CCCCW2          |                            |
| 005258 | D2 03 F 528 F 584 |        | MVC | CCWCC2(4),EIGHT9   | SET UP FOR EIGHT BYTES     |
| 00525E | 41 7 0 F 50C      |        | LA  | R7,DATA3           | SET UP COM CHAIN 3RD CCW   |
| 005262 | 5A 7 0 F 594      |        | A   | R7,COMC02          | SET COMMAND CODE OF WRITE  |
| 005266 | 50 7 0 F 52C      |        | ST  | R7,CCCCW3          |                            |
| 00526A | D2 03 F 530 F 56C |        | MVC | CCWCC3(4),EIGHT8   | SET UP FOR EIGHT BYTES     |
| 005270 | 41 7 0 F 2C0      |        | LA  | R7,ZIP16           | SET UP EIGHTH PSW (SEL)    |
| 005274 | 50 7 0 F 538      |        | ST  | R7,PSWC02          |                            |
| 005278 | D2 07 0 0E8 F 534 |        | MVC | NS2PSW(8,0),PSWCON | LOAD SELETOR 2 NEW PSW     |
| 00527E | 41 7 0 F 2A6      |        | LA  | R7,ZAP14           | SET UP NINTH PSW (TIMER)   |
| 005282 | 50 7 0 F 538      |        | ST  | R7,PSWC02          |                            |
| 005286 | D2 07 0 0A8 F 534 |        | MVC | NTMPSW(8,0),PSWCON | LOAD TIMER NEW PSW         |
| 00528C | D2 03 F 518 F 5D0 |        | MVC | TIMEND(4),TWFMSD   | LOAD TIMER WORD WITH FFF   |
| 005292 | 41 7 0 F 518      |        | LA  | R7,TIMEND          | SET UP TIMER CONTROL WORD  |
| 005296 | 50 7 0 0 190      |        | ST  | R7,TIMSCW(,0)      | STORE TIMER CONTROL WORD   |
| 00529A | 80 00 F 588       |        | SSM | TSEL21             | ALLOW SEL2, TIME INTERRUPT |
| 00529E | 9C 00 0 200       |        | SIO | 512(0)             |                            |
| 0052A2 | 47 F 0 F 2A2      | ZIP15  | BC  | 15,0               | LOOP WAITING FOR INTERRUPT |
| 0052A6 | 48 C 0 0 1A8      | ZAP14  | LH  | R12,424(,0)        | DISPLAY CSW DEVICE STATUS  |
| 0052AA | D7 03 F 560 F 600 |        | XC  | FLAP(4),ZERS       | IS THIS 1ST OR 2ND TIME    |
| 0052B0 | 47 8 0 F 28C      |        | BC  | 8,ZAP14A           | BRANCH IF 1ST TIME         |
| 0052B4 | 99 00 C 000       | ZAP14B | HPR | 0(R12)             | SEL2 COM CHAIN FAILED 2ND  |
| 0052B8 | 47 F 0 F 2C0      |        | BC  | UNCOND,ZIP16       |                            |
| 0052BC | 99 00 C 000       | ZAP14A | HPR | 0(R12)             | SEL2 COM CHAIN FAILED 1ST  |
| 0052C0 | D2 07 F 53C 0 068 | ZIP16  | MVC | LOOK(8),OS2PSW(0)  | CALL UP SELECTOR OLD PSW   |
| 0052C6 | 58 6 0 F 580      |        | L   | R6,CONST2          | LOAD REG6 WITH MASK WORD   |
| 0052CA | 54 6 0 F 540      |        | N   | R6,LOOK1           | CHECK SEL2 OLD PSW CC      |
| 0052CE | 47 8 0 F 2EC      |        | BC  | 8,ZIP17            | BRANCH IF COND CODE EQU 0  |
| 0052D2 | 48 C 0 0 069      | ZAP15  | LH  | R12,105(,0)        | DISPLAY SEL2 OLD PSW CC    |
| 0052D6 | D7 03 F 560 F 600 |        | XC  | FLAP(4),ZERS       | IS THIS 1ST OR 2ND TIME    |

|        |                   |        |     |                    |                            |
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| 0052DC | 47 8 0 F 2E8      |        | BC  | 8,ZAP15A           | BRANCH IF 1ST TIME         |
| 0052E0 | 99 00 C 000       | ZAP15B | HPR | 0(R12)             | INCORRECT CC SECOND TIME   |
| 0052E4 | 47 F 0 F 2EC      |        | BC  | UNCOND,ZIP17       |                            |
| 0052E8 | 99 00 C 000       | ZAP15A | HPR | 0(R12)             | INCORRECT CC FIRST TIME    |
| 0052EC | 07 03 F 550 F 510 | ZIP17  | XC  | STORE4(4),DATA4    |                            |
| 0052F2 | 47 8 0 F 310      |        | BC  | 8,ZIP18            | BRANCH IF DATA IS CORRECT  |
| 0052F6 | 48 C 0 F 550      | ZAP16  | LH  | R12,STORE4         | DISPLAY FIRST INPUT DATA   |
| 0052FA | 07 03 F 560 F 600 |        | XC  | FLAP(4),ZERS       | IS THIS 1ST OR 2ND TIME    |
| 005300 | 47 8 0 F 30C      |        | BC  | 8,ZAP16A           | BRANCH IF 1ST TIME         |
| 005304 | 99 00 C 000       | ZAP16B | HPR | 0(R12)             | 1ST COM CHAIN DATA BAD 2   |
| 005308 | 47 F 0 F 310      |        | BC  | UNCOND,ZIP18       |                            |
| 00530C | 99 00 C 000       | ZAP16A | HPR | 0(R12)             | 1ST COM CHAIN DATA BAD 1   |
| 005310 | 07 03 F 554 F 514 | ZIP18  | XC  | STORE5(4),DATA5    | CHK SECOND COM CHAIN DATA  |
| 005316 | 47 8 0 F 334      |        | BC  | 8,ZIP19            | BRANCH IF DATA IS CORRECT  |
| 00531A | 48 C 0 F 554      | ZAP17  | LH  | R12,STORE5         | DISPLAY SECOND INPUT DATA  |
| 00531E | 07 03 F 560 F 600 |        | XC  | FLAP(4),ZERS       | IS THIS 1ST OR 2ND TIME    |
| 005324 | 47 8 0 F 330      |        | BC  | 8,ZAP17A           | BRANCH IF 1ST TIME         |
| 005328 | 99 00 C 000       | ZAP17B | HPR | 0(R12)             | 2ND COM CHAIN DATA BAD 2   |
| 00532C | 47 F 0 F 334      |        | BC  | UNCOND,ZIP19       |                            |
| 005330 | 99 00 C 000       | ZAP17A | HPR | 0(R12)             | 2ND COM CHAIN DATA BAD 1   |
| 005334 | 02 13 F 544 F 600 | ZIP19  | MVC | STORE1(20),ZERS    | CLEAR STORAGE AREAS        |
| 00533A | 02 03 F 560 F 5AC |        | MVC | FLAP(4),CONST1     | SET FLAG TO SHOW (2)       |
| 005340 | 46 8 0 F 232      |        | BCT | R8,ZIP14           | REPEAT COM CHAIN TEST      |
| 005344 | 41 7 0 F 378      |        | LA  | R7,ZIP21           | SET UP TENTH PSW (SEL)     |
| 005348 | 50 7 0 F 538      |        | ST  | R7,PSWC02          |                            |
| 00534C | 02 07 0 0E8 F 534 |        | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 005352 | 41 0 0 F 558      |        | LA  | R0,CCWCON          | SET UP FOURTH CAW          |
| 005356 | 5A 0 0 F 500      |        | A   | R0,TESTBT          | SET TESTER BIT             |
| 00535A | 41 7 0 F 544      |        | LA  | R7,STORE1          | SET UP FOURTH CCW          |
| 00535E | 5A 7 0 F 58C      |        | A   | R7,COMC01          | SET COMMAND CODE OF READ   |
| 005362 | 50 7 0 F 558      |        | ST  | R7,CCWCON          |                            |
| 005366 | 02 03 F 55C F 56C |        | MVC | CCWC02(4),EIGHT8   | SET UP FOR EIGHT BYTES     |
| 00536C | 80 00 F 57C       |        | SSM | SEL2IN             | ALLOW SELECTOR 2 INTERRUPT |
| 005370 | 9C 00 0 200       |        | SIO | 512(0)             |                            |
| 005374 | 47 F 0 F 374      | ZIP20  | BC  | 15,*               | LOOP WAITING FOR INTERRUPT |
| 005378 | 02 01 F 53C 0 1A8 | ZIP21  | MVC | LOOK(2),S02CSW(0)  | CHECKING SELECTOR CSW      |
| 00537E | 07 01 F 53C F 58C |        | XC  | LOOK(2),COMST2     | COMPARE SELECTOR CSW       |
| 005384 | 47 8 0 F 390      |        | BC  | 8,ZIP22            | BRANCH IF CORRECT          |
| 005388 | 48 C 0 0 1A8      | ZAP18  | LH  | R12,S02CSW(,0)     | DISPLAY SELECTOR 2 CSW     |
| 00538C | 99 00 C 000       |        | HPR | 0(R12)             | IMPROPER SEL CSW FOR READ  |
| 005390 | 41 7 0 F 3C4      | ZIP22  | LA  | R7,ZIP24           | SET UP ELEVENTH PSW (SEL)  |
| 005394 | 50 7 0 F 538      |        | ST  | R7,PSWC02          |                            |
| 005398 | 02 07 0 0E8 F 534 |        | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 00539E | 41 0 0 F 558      |        | LA  | R0,CCWCON          | SET UP FIFTH CAW           |

|        |                   |       |     |                    |                            |
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| 0053A2 | 5A 0 0 F 500      |       | A   | RD,TESTBT          | SET TESTER BIT             |
| 0053A6 | 41 7 0 F 508      |       | LA  | R7,DATA2           | SET UP FIFTH CCW           |
| 0053AA | 5A 7 0 F 594      |       | A   | R7,COMC02          | SET COMMAND CODE OF WRITE  |
| 0053AE | 50 7 0 F 558      |       | ST  | R7,CCWCON          |                            |
| 0053B2 | 02 03 F 55C F 56C |       | MVC | CCWC02(4),EIGHTB   | SET UP FOR EIGHT BYTES     |
| 0053B8 | 80 00 F 57C       |       | SSM | SEL2IN             | ALLOW SELECTOR 2 INTERRUPT |
| 0053BC | 9C 00 0 200       |       | SIO | 512(0)             |                            |
| 0053C0 | 47 F 0 F 3C0      | ZIP23 | BC  | 15,*               | LOOP WAITING FOR INTERRUPT |
| 0053C4 | 02 01 F 53C 0 1A8 | ZIP24 | MVC | LOOK(2),S02CSW(0)  | CHECKING SELECTOR CSW      |
| 0053CA | 07 01 F 53C F 588 |       | XC  | LOOK(2),COMST0     | COMPARE SELECTOR CSW       |
| 0053D0 | 47 8 0 F 3DC      |       | BC  | 8,ZIP25            | BRANCH IF CORRECT          |
| 0053D4 | 48 C 0 0 1A8      | ZAP19 | LH  | R12,S02CSW(,0)     | DISPLAY SELECTOR 2 CSW     |
| 0053D8 | 99 00 C 000       |       | HPR | 0(R12)             | IMPROPER CSW FOR WRITE     |
| 0053DC | 41 7 0 F 410      | ZIP25 | LA  | R7,ZIP27           | SET UP TWELFTH PSW (SEL)   |
| 0053E0 | 50 7 0 F 538      |       | ST  | R7,PSWC02          |                            |
| 0053E4 | 02 07 0 0E8 F 534 |       | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 0053EA | 41 0 0 F 558      |       | LA  | RD,CCWCON          | SET UP SIXTH CAW           |
| 0053EE | 5A 0 0 F 500      |       | A   | RD,TESTBT          | SET TESTER BIT             |
| 0053F2 | 41 7 0 F 54C      |       | LA  | R7,STORE3          | SET UP SIXTH CCW           |
| 0053F6 | 5A 7 0 F 59C      |       | A   | R7,COMC03          | SET COMMAND CODE OF SENSE  |
| 0053FA | 50 7 0 F 558      |       | ST  | R7,CCWCON          |                            |
| 0053FE | 02 03 F 55C F 56C |       | MVC | CCWC02(4),EIGHTB   | SET UP FOR EIGHT BYTES     |
| 005404 | 80 00 F 57C       |       | SSM | SEL2IN             | ALLOW SELECTOR 2 INTERRUPT |
| 005408 | 9C 00 0 200       |       | SIO | 512(0)             |                            |
| 00540C | 47 F 0 F 40C      | ZIP26 | BC  | 15,*               | LOOP WAITING FOR INTERRUPT |
| 005410 | 02 01 F 53C 0 1A8 | ZIP27 | MVC | LOOK(2),S02CSW(0)  | CHECKING SELECTOR CSW      |
| 005416 | 07 01 F 53C F 5C0 |       | XC  | LOOK(2),COMST4     | COMPARE SELECTOR CSW       |
| 00541C | 47 8 0 F 428      |       | BC  | 8,ZIP28            | BRANCH IF CORRECT          |
| 005420 | 48 C 0 0 1A8      | ZAP20 | LH  | R12,S02CSW(,0)     | DISPLAY SELECTOR 2 CSW     |
| 005424 | 99 00 C 000       |       | HPR | 0(R12)             | IMPROPER SEL CSW ON SENSE  |
| 005428 | 41 7 0 F 45C      | ZIP28 | LA  | R7,ZIP30           | SET UP THIRINTH PSW (SEL)  |
| 00542C | 50 7 0 F 538      |       | ST  | R7,PSWC02          |                            |
| 005430 | 02 07 0 0E8 F 534 |       | MVC | NS2PSW(8,0),PSWCON | LOAD SELECTOR 2 NEW PSW    |
| 005436 | 41 0 0 F 558      |       | LA  | RD,CCWCON          | SET UP SEVENTH CAW         |
| 00543A | 5A 0 0 F 500      |       | A   | RD,TESTBT          | SET TESTER BIT             |
| 00543E | 41 7 0 F 510      |       | LA  | R7,DATA4           | SET UP SEVENTH CCW         |
| 005442 | 5A 7 0 F 5A4      |       | A   | R7,COMC04          | SET COM CODE FOR RD BKWRD  |
| 005446 | 50 7 0 F 558      |       | ST  | R7,CCWCON          |                            |
| 00544A | 02 03 F 55C F 56C |       | MVC | CCWC02(4),EIGHTB   | SET UP FOR EIGHT BYTES     |
| 005450 | 80 00 F 57C       |       | SSM | SEL2IN             | ALLOW SELECTOR 2 INTERRUPT |
| 005454 | 9C 00 0 200       |       | SIO | 512(0)             |                            |
| 005458 | 47 F 0 F 458      | ZIP29 | BC  | 15,*               | LOOP WAITING FOR INTERRUPT |
| 00545C | 02 01 F 53C 0 1A8 | ZIP30 | MVC | LOOK(2),S02CSW(0)  | CHECKING SELECTOR CSW      |
| 005462 | 07 01 F 53C F 5C4 |       | XC  | LOOK(2),COMST6     | COMPARE SELECTOR CSW       |



|        |              |        |      |                |                            |
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| 005468 | 47 8 0 F 474 |        | BC   | 8,ZIP31        | BRANCH IF CORRECT          |
| 00546C | 48 C 0 0 1A8 | ZAP21  | LH   | R12,S02CSW(,0) | DISPLAY SELECTOR 2 CSW     |
| 005470 | 99 00 C 000  |        | HPR  | O(R12)         | BAD CSW FOR RD BKWRD       |
| 005474 | 82 00 F 5F8  | ZIP31  | LPSW | LABEL          | RETURN TO EXEC             |
|        | 005500       |        | ORG  | \$SELTWO+1280  | SET ADDRESS TO HEX 5500    |
| 005500 | 00800000     | TESTBT | DC   | X'00800000'    | USED TO SET TESTER BIT     |
| 005504 | 0FF0AA55     | DATA1  | DC   | X'0FF0AA55'    | DATA FOR TRANSFER          |
| 005508 | 00FF00FF     | DATA2  | DC   | X'00FF00FF'    |                            |
| 00550C | 55AA55AA     | DATA3  | DC   | X'55AA55AA'    |                            |
| 005510 | 1C1C1C1C     | DATA4  | DC   | X'1C1C1C1C'    |                            |
| 005514 | E3E3E3E3     | DATA5  | DC   | X'E3E3E3E3'    |                            |
| 005518 | 00000000     | TIMESD | DC   | F'0'           | TIMER WRD FOR CONTROL WRD  |
| 00551C | 00000000     | CCCCW1 | DC   | F'0'           | FIRST COMMAND CHAIN CCW    |
| 005520 | 00000000     | CCWCC1 | DC   | F'0'           |                            |
| 005524 | 00000000     | CCCCW2 | DC   | F'0'           | SECOND COMMAND CHAIN CCW   |
| 005528 | 00000000     | CCWCC2 | DC   | F'0'           |                            |
| 00552C | 00000000     | CCCCW3 | DC   | F'0'           | THIRD COMMAND CHAIN CCW    |
| 005530 | 00000000     | CCWCC3 | DC   | F'0'           |                            |
| 005534 | 00000000     | PSWCON | DC   | F'0'           | STORAGE FOR SETTING PSW    |
| 005538 | 00000000     | PSWC02 | DC   | F'0'           |                            |
| 00553C | 00000000     | LOOK   | DC   | F'0'           | STORAGE FOR OLDP SW CALLUP |
| 005540 | 00000000     | LOOK1  | DC   | F'0'           |                            |
| 005544 | 00000000     | STORE1 | DC   | F'0'           | STORAGE FOR DATA TRANSFER  |
| 005548 | 00000000     | STORE2 | DC   | F'0'           |                            |
| 00554C | 00000000     | STORE3 | DC   | F'0'           |                            |
| 005550 | 00000000     | STORE4 | DC   | F'0'           |                            |
| 005554 | 00000000     | STORE5 | DC   | F'0'           |                            |
| 005558 | 00000000     | CCWCON | DC   | F'0'           | STORAGE FOR SETTING CCW    |
| 00555C | 00000000     | CCWC02 | DC   | F'0'           |                            |
| 005560 | 00000000     | FLAP   | DC   | F'0'           |                            |
| 005564 | 00000000     | CONST3 | DC   | F'0'           | VARIABLE MASK WORD         |
| 005568 | 00000000     | TIMTCW | DC   | F'0'           | TIMER CONTROL WORD         |
| 00556C | 00000008     | EIGHT8 | DC   | F'8'           | CONSTANT OF EIGHT          |
| 005570 | 00000002     | TWOO   | DC   | F'2'           | CONSTANT OF TWO            |
| 005574 | 00000000     | NOINT  | DC   | F'0'           | NO INTERRUPTS              |
| 005578 | 20000000     | SELINT | DC   | X'20000000'    | SELECTOR 1 INTERRUPT       |
| 00557C | 10000000     | SEL2IN | DC   | X'10000000'    | SELECTOR 2 INTERRUPT       |
| 005580 | 30000000     | SIORS2 | DC   | X'30000000'    | SEL1 & SEL2 INTERRUPTS     |
| 005584 | 40000000     | TIMINT | DC   | X'40000000'    | TIMER INTERRUPT            |
| 005588 | 50000000     | TSEL21 | DC   | X'50000000'    | SEL2 & TIMER INTERRUPTS    |
| 00558C | 02000000     | COMC01 | DC   | X'02000000'    | FIRST SELECTOR CSW READ    |
| 005590 | 08000000     |        | DC   | X'08000000'    |                            |
| 005594 | 01000000     | COMC02 | DC   | X'01000000'    | SECOND SELECTOR CSW WRITE  |
| 005598 | 08000000     |        | DC   | X'08000000'    |                            |

```

00559C 04000000
0055A0 08000000
0055A4 0C000000
0055A8 08000000
0055AC FF000000
0055B0 30000000
0055B4 40000008
0055B8 01000000
0055BC 02000000
0055C0 04000000
0055C4 0C000000
0055C8 00100000
0055CC 00000FFF
0055D0 FFF00000
0055D4 00000001
0055D8 08000000
0055DC 00005026
0055E0 0002
0055E2 55E4
0055E4 0080
0055E6 55E8
0055E8 0025
0055EA E2C5D3F2
0055EE 0025
0055F0 0080
0055F2 55E8
0055F4 0700 0700
0055F8 38000000 00000214
005600 00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
00000000
005000

```

```

COMC03 DC X'04000000'
DC X'08000000'
COMC04 DC X'0C000000'
DC X'08000000'
CONST1 DC X'FF000000'
CONST2 DC X'30000000'
EIGHT9 DC X'40000008'
COMST0 DC X'01000000'
COMST2 DC X'02000000'
COMST4 DC X'04000000'
COMST6 DC X'0C000000'
WONMS2 DC X'00100000'
BIGTWO DC X'00000FFF'
TWFMSD DC X'FFF00000'
MSG A DC F'1'
MSSPSW DC X'08000000'
DC A(BEGIN2)
DC X'0002'
DC Y(MSSBCW)
MSSBCW DC X'0080'
DC Y(COMMSS)
COMMSS DC X'0025'
DC C'SEL2'
DC X'0025'
MSSCON DC X'0080'
DC Y(COMMSS)
CNOP DC 0,8
DC X'38000000000000214'
ZERS DC 14F'0'

```

END

SSELTWO

THIRD SELECTOR CSW SENSE

FOURTH SEL CSW RD BKWRD

FIRST MASK WORD

SECOND MASK WORD

EIGHT BYTES FOR COM CHAIN

1MS COUNT FOR TIMER

COUNT FOR BCT

4 SECOND DELAY

CONSTANTS OF ZERO

|        | SIDBLOK | START<br>USING | EJECT<br>0<br>*,12 |
|--------|---------|----------------|--------------------|
| 000001 | B1      | EQU            | 1                  |
| 000002 | B2      | EQU            | 2                  |
| 000003 | B3      | EQU            | 3                  |
| 000004 | B4      | EQU            | 4                  |
| 000005 | B5      | EQU            | 5                  |
| 000006 | B6      | EQU            | 6                  |
| 000007 | B7      | EQU            | 7                  |
| 000008 | B8      | EQU            | 8                  |
| 000009 | B9      | EQU            | 9                  |
| 00000A | B10     | EQU            | 10                 |
| 00000B | B11     | EQU            | 11                 |
| 00000C | B12     | EQU            | 12                 |
| 00000D | B13     | EQU            | 13                 |
| 00000E | B14     | EQU            | 14                 |
| 00000F | B15     | EQU            | 15                 |
| 000000 | R0      | EQU            | 0                  |
| 000001 | R1      | EQU            | 1                  |
| 000002 | R2      | EQU            | 2                  |
| 000003 | R3      | EQU            | 3                  |
| 000004 | R4      | EQU            | 4                  |
| 000005 | R5      | EQU            | 5                  |
| 000006 | R6      | EQU            | 6                  |
| 000007 | R7      | EQU            | 7                  |
| 000008 | R8      | EQU            | 8                  |
| 000009 | R9      | EQU            | 9                  |
| 00000A | R10     | EQU            | 10                 |
| 00000B | R11     | EQU            | 11                 |
| 00000C | R12     | EQU            | 12                 |
| 00000D | R13     | EQU            | 13                 |
| 00000E | R14     | EQU            | 14                 |
| 00000F | R15     | EQU            | 15                 |

|        |        |     | EJECT  |  |
|--------|--------|-----|--------|--|
| 000000 | S0ABS  | EQU | 0      |  |
| 000010 | S1ABS  | EQU | 16     |  |
| 000020 | S2ABS  | EQU | 32     |  |
| 000030 | S3ABS  | EQU | 48     |  |
| 000040 | S4ABS  | EQU | 64     |  |
| 000050 | S5ABS  | EQU | 80     |  |
| 000060 | S6ABS  | EQU | 96     |  |
| 000070 | S7ABS  | EQU | 112    |  |
| 000080 | S8ABS  | EQU | 128    |  |
| 000090 | S9ABS  | EQU | 144    |  |
| 0000A0 | S10ABS | EQU | 160    |  |
| 0000B0 | S11ABS | EQU | 176    |  |
| 0000C0 | S12ABS | EQU | 192    |  |
| 0000D0 | S13ABS | EQU | 208    |  |
| 0000E0 | S14ABS | EQU | 224    |  |
| 0000F0 | S15ABS | EQU | 240    |  |
| 000008 | OSVPSW | EQU | X'008' |  |
| 000018 | OPRPSW | EQU | X'018' |  |
| 000028 | OTMPSW | EQU | X'028' |  |
| 000038 | OMSPSW | EQU | X'038' |  |
| 000048 | OMNPSW | EQU | X'048' |  |
| 000058 | OS1PSW | EQU | X'058' |  |
| 000068 | OS2PSW | EQU | X'068' |  |
| 000078 | ONUPSW | EQU | X'078' |  |
| 000088 | NSVPSW | EQU | X'088' |  |
| 000098 | NPRPSW | EQU | X'098' |  |
| 0000A8 | NTMPSW | EQU | X'0A8' |  |
| 0000B8 | NMSPSW | EQU | X'0B8' |  |
| 0000C8 | NMNPSW | EQU | X'0C8' |  |
| 0000D8 | NS1PSW | EQU | X'0D8' |  |
| 0000E8 | NS2PSW | EQU | X'0E8' |  |
| 000114 | IPLBCW | EQU | X'114' |  |
| 000190 | TCW    | EQU | X'190' |  |
| 0001A0 | CSW1   | EQU | X'1A0' |  |
| 0001A8 | CSW2   | EQU | X'1A8' |  |
| 000007 | NEQ    | EQU | 7      |  |
| 000008 | ZERO   | EQU | 8      |  |
| 000008 | EQL    | EQU | 8      |  |
| 00000C | OPILE  | EQU | 12     |  |
| 00000F | UNCOND | EQU | 15     |  |

|        |        |     |       |                                 |
|--------|--------|-----|-------|---------------------------------|
| 000E10 | ADR    | EQU | 3600  |                                 |
| 000E20 | TSETRX | EQU | 3616  | TAPE SERVO=NUMBER STORAGE       |
| 000E28 | BUFFER | EQU | 3624  |                                 |
| 000E48 | DATA   | EQU | 3656  |                                 |
| 000E50 | PRINT  | EQU | 3664  |                                 |
| 000EA0 | INPUT  | EQU | 3744  |                                 |
| 000EE0 | CYLNUM | EQU | 3808  | DISC CYLINDER NUMBER            |
| 000EE4 | TRKNUM | EQU | 3812  | DISC TRACK NUMBER               |
| 000F00 | F00    | EQU | 3840  |                                 |
| 000F04 | F04    | EQU | 3844  |                                 |
| 000F08 | BPAK11 | EQU | 3848  | TAPE BLOCKING IFO PACKET AT F08 |
| 000130 | D8411  | EQU | 304   | CONSTANT OF 0130 FOR DEVICE NR  |
| 004000 | DVNTBL | EQU | 16384 | ADDRESS OF DEVICE # TABLE (S10) |
| 005000 | CCWEQU | EQU | 20480 | ADDRESS OF CCW TABLE FOR S10    |

## EJECT

## \* 9400 PRE-MAR IDENTIFIER BLOCK \*

| Address | Hex Data          | Field Name | Format | Description                   |
|---------|-------------------|------------|--------|-------------------------------|
| 000000  | C4D4D9F1          | CAW        | DC     | IDENTIFIER CODE               |
| 000004  | 00000080          | CONSOL     | DC     | CONSOLE DEVICE ADDRESS        |
| 000008  | 00000000 00000000 | OLDSUP     | DC     | OLD SUPERVISOR PSW            |
| 000010  | 00000000          |            | DC     | SUPERVISOR REGISTER 1         |
| 000014  | 00000090          | CREADR     | DC     | CADR RDR. DEVICE ADDRESS      |
| 000018  | 00000000          |            | DC     | OLD PSW ( PROGRAM )           |
|         | 00000000          |            |        |                               |
| 000020  | 00000000          |            | DC     | SUPERVISOR REGISTER 2         |
| 000024  | 000000A0          | PNCHDN     | DC     | PUNCH DEVICE ADDRESS          |
| 000028  | 00000000          |            | DC     | OLD PSW ( TIMER )             |
|         | 00000000          |            |        |                               |
| 000030  | 00000000          |            | DC     | SUPERVISOR REGISTER 3         |
| 000034  | 000000B0          | HSPDYN     | DC     | PRINTER DEVICE ADDRESS        |
| 000038  | 0000FFFF          |            | DC     | OLD PSW ( MPX-SH )            |
|         | 0000FFFF          |            |        |                               |
| 000040  | 00000000          |            | DC     | SUPERVISOR REGISTER 4         |
| 000044  | 00000000          | TAPENN     | DC     | TAPE SERVO #                  |
| 000048  | 00000000          |            | DC     | OLD PSW ( MPX-NS )            |
|         | 00000000          |            |        |                               |
| 000050  | 00000000          |            | DC     | SUPERVISOR REGISTER 5         |
| 000054  | 00000000          | LINENR     | DC     |                               |
| 000058  | 0000FFFF          |            | DC     | OLD PSW ( SEL 1 )             |
|         | 0000FFFF          |            |        |                               |
| 000060  | 00000000          |            | DC     | SUPERVISOR REGISTER 6         |
| 000064  | 00000000          | ITEMXX     | DC     | ITEM # FOR LISTING            |
| 000068  | 0000FFFF          |            | DC     | OLD PSW ( SEL 2 )             |
|         | 0000FFFF          |            |        |                               |
| 000070  | 00000000          |            | DC     | SUPERVISOR REGISTER 7         |
| 000074  | 00000E00          | E00        | DC     | CONSTANT TO GET SEL CHN #     |
| 000078  | 00000002          | TESTDD     | DC     | READ COMMAND FOR DEVICE-TABLE |
| 00007C  | 00004000          |            | DC     | READ 4096 BYTES INTO TABLE    |
| 000080  | 00000000          |            | DC     | SUPERVISOR REGISTER 8         |
| 000084  | 4040              | BLANKS     | DC     | 2 BLANKS                      |
| 000086  | 0D25              | FEED       | DC     | CARRIAGE RETURN+LINE FEED     |
| 000088  | 00000000 00000400 |            | DC     | NEW PSW ( SUPERVISOR )        |

|        |          |          |        |    |               |                                 |
|--------|----------|----------|--------|----|---------------|---------------------------------|
| 000090 | 00000000 |          | EJECT  | DC | F'0'          | SUPERVISOR REGISTER 9           |
| 000094 | 0000000F |          |        | DC | F'15'         |                                 |
| 000098 | 00000000 | 00000400 | TOPZ   | DC | XL8'00000400' | NEW PSW ( PROGRAM )             |
| 0000A0 | 00000000 |          |        | DC | F'0'          | SUPERVISOR REGISTER 10          |
| 0000A4 | 00004000 |          | DVNLDC | DC | A(DVNTBL)     | ADDRESS OF DEVICE # TABLE (SIO) |
| 0000A8 | 00000000 | 00000400 |        | DC | XL8'00000400' | NEW PSW ( TIMER )               |
| 0000B0 | 00000000 |          |        | DC | F'0'          | SUPERVISOR REGISTER 11          |
| 0000B4 | 0000FFFF |          | HALF   | DC | X'0000FFFF'   |                                 |
| 0000B8 | 00000000 | 00000400 |        | DC | XL8'00000400' | NEW PSW ( MPX-SH )              |
| 0000C0 | 00000000 |          |        | DC | F'0'          | SUPERVISOR REGISTER 12          |
| 0000C4 | 00000000 |          | TEMP   | DC | F'0'          |                                 |
| 0000C8 | 00000000 | 00000400 |        | DC | XL8'00000400' | NEW PSW ( MPX-NS )              |
| 0000D0 | 00000000 |          |        | DC | F'0'          | SUPERVISOR REGISTER 13          |
| 0000D4 | 00000000 |          | KIND   | DC | F'0'          | • BUFFER •                      |
| 0000D8 | 00000000 | 00000400 |        | DC | XL8'00000400' | NEW PSW ( SEL 1 )               |
| 0000E0 | 00000000 |          |        | DC | F'0'          | SUPERVISOR REGISTER 14          |
| 0000E4 | C4D6D5C5 |          | DONE   | DC | C'DONE'       |                                 |
| 0000E8 | 00000000 | 00000400 |        | DC | XL8'00000400' | NEW PSW ( SEL 2 )               |
| 0000F0 | 00000000 |          |        | DC | F'0'          | SUPERVISOR REGISTER 15          |
| 0000F4 | 00001000 |          | ONEK   | DC | X'00001000'   |                                 |
| 0000F8 | 00000002 |          | TESTCC | DC | F'2'          | INPUT PACKET                    |
| 0000FC | 00005000 |          | CCWS   | DC | A(CCW EQU)    | ADDRESS OF CCW TABLE FOR SIO    |
| 000100 | 00800000 |          |        | DC | X'00800000'   | CONSOLE SHARED SCW              |
| 000104 | 00000000 |          |        | DC | 3F'0'         | HARDWARE STORAGE                |
|        | 00000000 |          |        |    |               |                                 |
|        | 00000000 |          |        |    |               |                                 |
| 000110 | 00000114 |          |        | DC | X'00000114'   | MPX-SHARED SCW # 1              |
| 000114 | EEA00118 |          |        | DC | X'EEA00118'   | INITIAL LOAD BCW                |

|        |             |        |       |    |               |                                |
|--------|-------------|--------|-------|----|---------------|--------------------------------|
| 000118 | 0000001F    | EOFPK  | EJECT | DC | X'0000001F'   | END OF BLOCK/FILE MARKER       |
| 00011C | 00010FF0    |        |       | DC | X'00010FF0'   | NO TRANSFER                    |
| 000120 | 00000114    |        |       | DC | X'00000114'   | MPX-SHARED SCW # 2             |
| 000124 | 00000000    | IMAGEX |       | DC | F'0'          |                                |
| 000128 | 38000000 30 | SELPSW |       | DC | X'3800000030' | NEW PSW FOR SELECTOR CHANNEL 1 |
| 00012D | 0008DA      |        |       | DC | AL3(DVCEND)   | RETURN ADDRESS FOR INTERRUPT   |
| 000130 | 00000114    |        |       | DC | X'00000114'   | MPX-SHARED SCW # 3             |
| 000134 | 00000002    | PACK1  |       | DC | F'2'          |                                |
| 000138 | 006D        |        |       | DC | X'006D'       | 6 BYTE INPUT                   |
| 00013A | 0EAD        |        |       | DC | Y(INPUT)      |                                |
| 00013C | 00000114    | INPSCW |       | DC | X'00000114'   | INPUT SCW                      |
| 000140 | 00000114    |        |       | DC | X'00000114'   | MPX-SHARED SCW # 4             |
| 000144 | 00000002    | PACK2  |       | DC | F'2'          |                                |
| 000148 | 00AD        |        |       | DC | X'00AD'       | 10 BYTE INPUT                  |
| 00014A | 0EAC        |        |       | DC | Y(INPUT+12)   |                                |
| 00014C | 00020114    | OUTSCW |       | DC | X'00020114'   | OUTPUT SCW                     |



|        |          |        |       |             |             |                           |
|--------|----------|--------|-------|-------------|-------------|---------------------------|
| 000150 | 00000114 |        | EJECT | DC          | X'00000114' | MPX=SHARED SCW # 5        |
| 000154 | 00000001 | PACK3  | DC    | F'1'        |             | WRITE COMMAND             |
| 000158 | 0020     |        | DC    | X'0020'     |             | 2 BYTE OUTPUT             |
| 00015A | 0086     |        | DC    | Y(FEED)     |             | ADDRESS OF CR/LF BUFFER   |
| 00015C | C3E8D37A | CYLMS  | DC    | C'CYL:'     |             | REQUEST CYLINDER NUMBER   |
| 000160 | 00000114 |        | DC    | X'00000114' |             | MPX=SHARED SCW #6         |
| 000164 | 00000001 | PACK4  | DC    | F'1'        |             |                           |
| 000168 | 0020     |        | DC    | X'0020'     |             | 2 BYTE OUTPUT             |
| 00016A | 0084     |        | DC    | Y(BLANKS)   |             |                           |
| 00016C | E3D9D27A | TRKMS  | DC    | C'TRK:'     |             |                           |
| 000170 | 00000114 |        | DC    | X'00000114' |             | MPX=SHARED SCW # 7        |
| 000174 | 00000001 | PACK5  | DC    | F'1'        |             |                           |
| 000178 | 0060     |        | DC    | X'0060'     |             |                           |
| 00017A | 0E50     |        | DC    | Y(PRINT)    |             |                           |
| 00017C | 00000000 | SEGNUM | DC    | F'0'        |             |                           |
| 000180 | 00800000 |        | DC    | X'00800000' |             | MPX NON-SHARED STATUS SGW |
| 000184 | 00000001 | PACK6  | DC    | F'1'        |             |                           |
| 000188 | 0320     |        | DC    | X'0320'     |             | 50 BYTE OUTPUT            |
| 00018A | 0E50     |        | DC    | Y(PRINT)    |             |                           |
| 00018C | 00000FFF | FFF    | DC    | X'00000FFF' |             |                           |
| 000190 | 00800000 |        | DC    | X'00800000' |             | TIMER SCW                 |
| 000194 | 00000001 | PACK7  | DC    | F'1'        |             |                           |
| 000198 | 0240     |        | DC    | X'0240'     |             | 36 BYTE OUTPUT            |
| 00019A | 09C0     |        | DC    | Y(SERVE)    |             |                           |
| 00019C | FFFFFFFF | ALLF   | DC    | X'FFFFFFFF' |             | SELECTOR CHANNEL 1 CSW    |
| 0001A0 | 00000000 |        | DC    | 2F'0'       |             |                           |
|        | 00000000 |        |       |             |             |                           |
| 0001A8 | 00000000 |        | DC    | 2F'0'       |             | SELECTOR CHANNEL 2 CSW    |
|        | 00000000 |        |       |             |             |                           |

|        |                   |        |       |                    |      |                                 |
|--------|-------------------|--------|-------|--------------------|------|---------------------------------|
| 000180 | 00000002          | PACK8  | EJECT | DC                 | F'2' |                                 |
| 000184 | 0040              |        | DC    | X'0040'            |      | 4 BYTE INPUT                    |
| 000186 | 00D4              |        | DC    | Y(KIND)            |      |                                 |
| 000188 | 00000015          | PNCHXX | DC    | X'00000015'        |      | PUNCH IN IMAGE MODE             |
| 00018C | 0320              |        | DC    | X'0320'            |      |                                 |
| 00018E | 0E50              |        | DC    | Y(PRINT)           |      |                                 |
| 0001C0 | 00000001          | WDF    | DC    | F'1'               |      |                                 |
| 0001C4 | 0080              |        | DC    | X'0080'            |      | 8 BYTE OUTPUT                   |
| 0001C6 | 04E0              |        | DC    | Y(WHAT)            |      |                                 |
| 0001C8 | 00000001          | DVNPAK | DC    | F'1'               |      |                                 |
| 0001CC | 0100              |        | DC    | X'0100'            |      | 16 BYTE OUTPUT                  |
| 0001CE | 0A10              |        | DC    | Y(DVCMMSG)         |      |                                 |
| 0001D0 | 00000001          | CCWPAK | DC    | F'1'               |      |                                 |
| 0001D4 | 0100              |        | DC    | X'0100'            |      | 16 BYTE OUTPUT                  |
| 0001D6 | 0A00              |        | DC    | Y(CCWMMSG)         |      |                                 |
| 0001D8 | 00000009          | PRINTX | DC    | F'9'               |      |                                 |
| 0001DC | 0320              |        | DC    | X'0320'            |      | 50 BYTE OUTPUT                  |
| 0001DE | 0E50              |        | DC    | Y(PRINT)           |      |                                 |
| 0001E0 | 50 E 0 C 0D4      | MSG4   | ST    | R14,KIND           |      |                                 |
| 0001E4 | 58 E 0 C 0D4      |        | L     | R14,CONSOL         |      |                                 |
| 0001E8 | D2 03 C E50 1 000 |        | MVC   | PRINT(4,R12),0(B1) |      |                                 |
| 0001EE | 98 0 2 C 174      |        | LM    | R0,R2,PACK5        |      |                                 |
| 0001F2 | 45 B 0 C 200      |        | BAL   | B11,S10XX          |      |                                 |
| 0001F6 | 58 E 0 C 0D4      |        | L     | R14,KIND           |      |                                 |
| 0001FA | 07 F A            |        | BCR   | 15,B10             |      | DONE NOW EXIT                   |
| 0001FC | 82 00 0 068       | ATNSL2 | LPSW  | OS2PSW             |      | RETURN TO PRE-INTERRUPT ADDRESS |

```

000200 80 00 C 298
000204 98 3 4 C 298
000208 90 3 4 0 0D8
00020C 90 3 4 0 0E8
000210 90 3 4 0 0B8
000214 41 D 0 0 100
000218 19 E D
00021A 47 A 0 C 266
00021E 18 D E
000220 94 70 0 0D3
000224 41 D 0 0 100
000228 91 01 0 003
00022C 47 1 0 C 244
000230 58 2 0 C 13C
000234 50 2 0 0 000
000238 50 1 0 0 114
00023C 9C 00 E 000
000240 47 F 0 C 240
000244 58 2 0 C 14C
000248 47 F 0 C 234
00024C 91 80 0 100
000250 47 1 0 C 4E4
000254 91 01 0 100
000258 47 1 0 C 200
00025C 91 04 D 000
000260 07 1 B
000262 47 F 0 C 24C

```

## EJECT

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* GENERALIZED I/O ROUTINE

SIOXX SSM IOPSW ALLOW ANY I/O INTERRUPTS
 LM R3,R4,IOPSW PICKUP PSW (MASK,CC,RETURN)
 STM R3,R4,NS1PSW SAVE AS NEW PSW
 STM R3,R4,NS2PSW SAVE AS NEW PSW
 STM R3,R4,NMSPSW SAVE AS NEW PSW
 LA R13,256 DETERMINE I/O CHANNEL...
 CR R14,R13 R14 HAS DEVICE ADDRESS...
 BC 10,SELXXX BRANCH IF SELECTOR CH...
MPXXX LR R13,R14 GET DEVICE ADR FROM R14
 NI S13ABS+3,X'70' STRIP DOWN TO DEVICE #0
 LA R13,256(,R13) ADD 0100 TO GET SCW AD7
 TM SOABS+3(0),X'01' OUTPUT ?
 BC 1,SCWOUT BRANCH IF OUTPUT
 L R2,INPSCW INPUT. GET SCW
 ST R2,0(,R13) STORE SCW AWAY
 ST R1,X'114'(,0) STORE BCW AWAY
 SIO 0(R14) INITIATE I/O TO DEVICE
 BC 15,* WAIT FOR PSW SWAP/INTERRUPT
 L R2,OUTSCW GET OUTPUT SCW
 BC 15,GOTSCW RE=JOIN MPX I/O
 TM X'100',X'80' CONSOLE : ATTENTION
 BC 1,RUN CONSOLE ATTENTION
 TM X'100'(0),X'01' TEST FOR ERROR=CLEAR FROM CONS.
 BC 1,SIOXX BRANCH IF ERROR TYPE=IN
 TM 0(R13),X'04' INTERRUPT. DEVICE END ?
 BCR 1,B11 EXIT IF DEVICE END.
 BC 15,IORX WAIT FOR DEVICE END

```

6-208

|        |                    |        |       |      |                          |                               |
|--------|--------------------|--------|-------|------|--------------------------|-------------------------------|
| 0002A8 | 45 D 0 C 2DA       | TRANS  | EJECT | BAL  | B13,ADRT00               | GET FD CHR READY FOR PRINTING |
| 0002AC | 41 5 0 0 004       | GOTADR |       | LA   | R5,4                     | 4 COLUMNS OF 8 DIGITS         |
| 0002B0 | 41 4 0 0 008       | LOOPA  |       | LA   | R4,8                     | 8 DIGITS.                     |
| 0002B4 | 17 2 2             |        |       | XR   | R2,R2                    | CLEAR OUT GARBAGE             |
| 0002B6 | F3 8 4 0 E28 7 000 |        |       | UNPK | BUFFER(9,0),X'0'(5,R7)   | UNPACK DATA TO CONVERT        |
| 0002BC | 45 F 0 C 304       | LOOPB  |       | BAL  | B15,TRANSL               | CALL TRANSLATE SUBROUTINE     |
| 0002C0 | 41 7 0 7 004       |        |       | LA   | R7,4(,R7)                |                               |
| 0002C4 | D2 01 3 E50 C 084  |        |       | MVC  | PRINT(2,R3),BLANKS       | INSERT 2 BLANKS IN BUFFER     |
| 0002CA | 41 3 0 3 002       |        |       | LA   | R3,2(,R3)                |                               |
| 0002CE | 46 5 0 C 280       |        |       | BCT  | R5,LOOPA                 | DO MORE WORDS                 |
| 0002D2 | D2 01 3 E50 C 086  |        |       | MVC  | PRINT(2,R3),FEED         | INSERT CR,LF                  |
| 0002D8 | 07 F 8             |        |       | BCR  | 15,B11                   | DONE NOW EXIT                 |
| 0002DA | 41 5 0 0 001       | ADRT00 |       | LA   | R5,1                     | ONE PASS THROUGH THE ROUTINE  |
| 0002DE | 41 4 0 0 004       |        |       | LA   | R4,4                     | CONVERT 4 DIGITS              |
| 0002E2 | 17 2 2             |        |       | XR   | R2,R2                    |                               |
| 0002E4 | F3 4 2 0 E28 0 072 |        |       | UNPK | BUFFER(5,0);S7ABS+2(3,0) | UNPACK LOW END OF R7          |
| 0002EA | 45 F 0 C 304       |        |       | BAL  | B15,TRANSL               | CALL TRANSLATE SUBROUTINE     |
| 0002EE | D2 01 3 E50 C 084  |        |       | MVC  | PRINT(2,R3),BLANKS       | INSERT 2 BLANKS               |
| 0002F4 | 41 3 0 3 002       |        |       | LA   | R3,2(,R3)                | INCREMENT PRINT POINTER       |
| 0002F8 | D2 01 3 E50 C 084  |        |       | MVC  | PRINT(2,R3),BLANKS       | INSERT 2 BLANKS               |
| 0002FE | 41 3 0 3 002       |        |       | LA   | R3,2(,R3)                | INCREMENT PRINT POINTER       |
| 000302 | 07 F 0             |        |       | BCR  | 15,R13                   | DONE...EXIT                   |
| 000304 | 17 1 1             | TRANSL |       | XR   | R1,R1                    | * TRANSLATE DATA TO EBCDIC *  |
| 000306 | 43 1 2 0 E28       |        |       | IC   | R1,BUFFER(R2)            | GET DIGIT TO TRANSLATE        |
| 00030A | 54 1 0 C 094       |        |       | N    | R1,TOPZ                  | STRIP OFF TOP DIGIT           |
| 00030E | 50 1 0 C 0C4       |        |       | ST   | R1,TEMP                  | SAVE                          |
| 000312 | DC 00 C 0C7 C A20  |        |       | TR   | TEMP+3(1),TABLE          | GET EBCDIC CODE FROM TABLE    |
| 000318 | D2 00 3 E50 C 0C7  |        |       | MVC  | PRINT(1,R3),TEMP+3       | INSERT IN PRINT BUFFER        |
| 00031E | 41 2 0 2 001       |        |       | LA   | R2,1(,R2)                | INCREMENT DIGIT POINTER       |
| 000322 | 41 3 0 3 001       |        |       | LA   | R3,1(,R3)                | INCREMENT BUFFER POINTER      |
| 000326 | 46 4 0 C 304       |        |       | BCT  | R4,TRANSL                | FINISH OUT THE WORD           |
| 00032A | 07 F F             |        |       | BCR  | 15,R15                   | DONE...EXIT                   |

|        |                    |        |       |                         |                             |
|--------|--------------------|--------|-------|-------------------------|-----------------------------|
| 00032C | 91 FO 1 000        | CONVRT | EJECT | 0(R1),X'FO'             | LOOK FOR ZONE               |
| 000330 | 47 1 0 C 33C       |        | TM    | 1,AGAIN                 | ZONE WAS FOR 0-9 CC = 3     |
| 000334 | 47 4 0 C 344       |        | BC    | 4,ADD9                  | ZONE WAS FOR A-F CC = 1     |
| 000338 | 47 8 0 C 356       |        | BC    | 8,XIT                   | ZONE WAS CLEARED CC = 0     |
| 00033C | 41 1 0 1 001       | AGAIN  | LA    | R1,1(R1)                | INCREMENT BYTE POINTER      |
| 000340 | 47 F 0 C 32C       |        | BC    | UNCOND,CONVRT           | PROCESS NEXT BYTE           |
| 000344 | 43 5 0 1 000       | ADD9   | IC    | R5,0(,1)                | PICKUP CHARACTER            |
| 000348 | 41 5 0 5 009       |        | LA    | R5,9(,R5)               | BYTE IS NOW HEX             |
| 00034C | 42 5 0 1 000       |        | STC   | R5,0(,R1)               | PUT CHARACTER BACK          |
| 000350 | 17 5 5             |        | XR    | R5,R5                   | CLEAR OUT R5                |
| 000352 | 47 F 0 C 33C       |        | BC    | UNCOND,AGAIN            | PROCESS NEXT BYTE           |
| 000356 | 41 6 0 0 E10       | XIT    | LA    | R6,ADR                  |                             |
| 00035A | 19 2 6             |        | CR    | R2,R6                   | IS ADDRESS BEING PACKED ?   |
| 00035C | 47 8 0 C 36C       |        | BC    | EQL,ADRNP               | YES.                        |
| 000360 | F2 4 8 0 E48 0 EAC |        | PACK  | DATA(5,0),INPUT+12(9,0) | NO. PACK THE DATA           |
| 000366 | 58 3 0 0 E48       |        | L     | R3,DATA                 | KEEP INSTRUCTION IN R3      |
| 00036A | 07 F 8             | OUT    | BCR   | 15,B11                  | DONE...EXIT                 |
| 00036C | F2 2 4 0 E10 0 EAD | ADRNP  | PACK  | ADR(3,0),INPUT(5,0)     | PACK ADDRESS                |
| 000372 | 48 4 0 0 E10       |        | LH    | R4,ADR(,0)              | KEEP ADDRESS IN R4          |
| 000376 | 54 4 0 C 0B4       |        | N     | R4,HALF                 | AND OUT ANY SIGN PROPAGATED |
| 00037A | 50 4 0 0 E10       |        | ST    | R4,ADR                  | SAVE VALUE                  |
| 00037E | 07 F 8             |        | BCR   | 15,B11                  | DONE NOW EXIT               |

```

000380 45 1 0 C ABC
000384 50 4 0 C 17C
000388 41 1 0 C 390
00038C 47 F 0 C ABC
000390 58 E 0 C 17C
000394 98 0 2 C B64
000398 45 B 0 C 200
00039C 91 05 D 000
0003A0 47 1 0 C 3CE
0003A4 17 1 1
0003A6 17 1 1
0003A8 48 1 0 0 116
0003AC 54 1 0 C 18C
0003B0 41 2 0 0 004
0003B4 1A 1 1
0003B6 46 2 0 C 3B4
0003BA 40 1 0 C B70
0003BE 58 E 0 C 044
0003C2 98 0 2 C B6C
0003C6 45 B 0 C 200
0003CA 47 F 0 C 390
0003CE 98 0 2 C C40
0003D2 45 B 0 C 200
0003D6 58 E 0 C 044
0003DA 47 F 0 C CEE
0003DE 41 1 0 C 3E6
0003E2 47 F 0 C ABC
0003E6 18 E 4
0003E8 47 F 0 C 588
0003EC 0000000C
0003F0 05003000
0003F4 00000009
0003F8 0020
0003FA 0084

```

```

EJECT
TCOPY BAL R1,TSETUP
CPYX01 ST R4,SEGNUM
LA R1,CPYX02
BC 15,TSETUP
CPYX02 L R14,SEGNUM
LM R0,R2,TINPAK
BAL B11,SIOXX
TM 0(R13),X'05'
BC 1,REWIND
CPYX03 XR R1,R1
XR R1,R1
LH R1,278
N R1,FFF
LA R2,4
AR R1,R1
BCT R2,0-2
STH R1,TOUTPK+4
L R14,TAPENN
LM R0,R2,TOUTPK
CPYSIO BAL B11,SIOXX
BC 15,CPYX02
REWIND LM R0,R2,TRWPAK
BAL B11,SIOXX
L R14,TAPENN
BC 15,E0FE0F
EDUMP LA R1,EDMP1
BC 15,TSETUP
EDMP1 LR R14,R4
BC 15,CONDO
BACKWD DC F'00000012'
DC X'05003000'
PSKIP DC F'9'
DC X'0020'
DC Y(BLANKS)

```

```

REQUEST TAPE SERVO NR ..INPUT..
SAVE SERVO DEVICE ADDRESS
RETURN ADR
REQUEST SERVO # (OUTPUT TAPE)
SOURCE SERVO DEVICE ADDRESS
INPUT PACKET
READ 3600-BYTE BLOCK
DID I JUST READ AN END-OF-FILE?
REWIND INPUT TAPE & COPY AGAIN
CLEAR R1
CLEAR R1
GET LAST ADDRESS READ INTO
AND-OUT THE 1K BIAS
SHIFT 1 DIGIT
MULTIPLY BY 16
REPEAT
SAVE NEW BYTE COUNT
OUTPUT TAPE SERVO
OUTPUT PACKET
WRITE ON OUTPUT TAPE
GO GET NEXT BLOCK FROM SOURCE
GET REWIND PACKET
REWIND INPUT SERVO
GET OUTPUT TAPE ##
COPY THE END-OF-FILE
RETURN ADDRESS FROM TSETUP
REQUEST TAPE-SERVO NUMBER
GET TAPE SERVO #### IN R14
JOIN DUMP ROUTINE NOW
READ BACKWARD COMMAND
READ 80 BYTES INTO LOCATION 3000

```

EJECT

\*\*\*\*\*  
 \* START OF 9400 SERVICE ROUTINES  
 \*\*\*\*\*

000400 17 C C  
 000402 17 E E  
 000404 58 E 0 C 004  
 000408 45 A 0 C 73A  
 00040C 45 A 0 C 73A  
 000410 98 0 2 C 194  
 000414 45 B 0 C 200  
 000418 45 A 0 C 73A  
 00041C 98 1 4 C C30  
 000420 90 1 4 0 FE4  
 000424 90 1 4 0 FFD  
 000428 58 E 0 C 004  
 00042C 45 A 0 C 73A  
 000430 45 A 0 C 73A  
 000434 41 1 0 C 4D4  
 000438 45 A 0 C 1E0  
 00043C 45 A 0 C 73A  
 000440 80 00 C 298  
 000444 41 1 0 C 4E4  
 000448 40 1 0 0 0BE  
 00044C 47 F 0 C 440

|        |     |                 |                                   |
|--------|-----|-----------------|-----------------------------------|
|        | ORG | SIDBLOK+1024    |                                   |
| INITLL | XR  | R12,R12         | CLEAR BASE REGISTER               |
|        | XR  | R14,R14         | CLEAR OUT DEVICE ADDRESS REGISTER |
|        | L   | R14,CONSOL      | SETUP CONSOLE I/O                 |
|        | BAL | B10,FEEDRN      | PRINT CARRIAGE RETURN/LINE FEED   |
|        | BAL | B10,FEEDRN      | PRINT CARRIAGE RETURN/LINE FEED   |
|        | LM  | RO,R2,PACK7     | PACKET TO PRINT TITLE MSG         |
|        | BAL | B11,S10XX       | PRINT TITLE                       |
|        | BAL | B10,FEEDRN      | PRINT CARRIAGE RETURN/LINE FEED   |
| BEGIN  | LM  | R1,R4,DSET      | SETUP DISC CONSTANTS              |
|        | STM | R1,R4,X'FE4'(0) | CLEAR DISC SEARCH BUFFER AREA     |
|        | STM | R1,R4,4080      | SETUP DISC CONSTANTS              |
|        | L   | R14,CONSOL      | GET REQUEST FOR SERVICE/CONSOLE   |
|        | BAL | B10,FEEDRN      | SEND CARRIAGE RETURN, LINE FEED   |
|        | BAL | B10,FEEDRN      | SEND CARRIAGE RETURN, LINE FEED   |
|        | LA  | R1,RACK         | IDLE MESSAGE                      |
|        | BAL | B10,MSG4        | PRINT MSG ON CONSOLE              |
|        | BAL | B10,FEEDRN      | PRINT CARRIAGE RETURN/LINE FEED   |
| IDLE   | SSM | IOPSW           | ALLOW CONSOLE INTERRUPTS          |
|        | LA  | R1,RUN          | INTERRUPT RETURN ADDRESS          |
|        | STH | R1,NMSPSW+6     | SAVE IN NEW MUX+SHARED PSW        |
|        | BC  | 15,IDLE         | WAIT FOR ATTENTION                |



## EJECT

000450 C2E3E8D7  
 000454 C3D6C4C5  
 000458 C3D6D54D  
 00045C C3D6D7E8  
 000460 C35BD7D3  
 000464 C4C9E2C3  
 000468 C4E4D4D7  
 00046C C5C2C3C4  
 000470 C5C4C9E3  
 000474 C5C4E4D4  
 000478 C5D6C64D  
 00047C C9C4D3C5  
 000480 C9D5D7E4  
 000484 D1E4D4D7  
 000488 D3C9E2E3  
 00048C D4C1D2C5  
 000490 D6E4E3D7  
 000494 D7C1C7C5  
 000498 D7C5C64D  
 00049C D7D9C9D5  
 0004A0 D7E4D5C3  
 0004A4 E2C3D6D7  
 0004A8 E2C9D64D  
 0004AC E3C4E4D4  
 0004B0 E3C5E2E3  
 0004B4 E3D9C5C1  
 0004B8 E3D9E64D  
 0004BC E4E3E24D

```

* SERVICE ROUTINE REQUEST IDENTIFIERS

BTYPE DC C'BTYPE' CONSOLE DATA TYPE-IN (F.W. ADR)
CODE DC C'CODE' LOAD CODE INTO PRINTER
TSTCON DC C'CON ' TYPE-IN PATTERN FOR CONSOLE TEST
COPYT DC C'COPY' COPY TAPE FROM SERVO ## TO NR ##
 DC C'CSPL' COMPILER LOAD REQUESTED
TTDISC DC C'DISC' COPY MASTER TAPE ONTO DISC
RDUMP DC C'DUMP' CONSOLE DUMP FULL-WORD ADR=ADR
 DC C'EBCD' EBCDIC DATA ENTRY ROUTINE
EDITTP DC C'EDIT' EDIT CARD IMAGE #### ON TAPE ####
 DC C'EDUM' DUMP EBCDIC ONTO TAPE (MEM DMP)
EOFREQ DC C'EOF ' WRITE TAPE-END-OF-FILE
 DC C'IDLE' RETURN TO IDLE LOOP
 DC C'INPU' TAPE BLOCKING SUBROUTINE INPUT
RJUMP DC C'JUMP' JUMP TO SOME MEMORY ADR
LISTC DC C'LIST' PRINT CARD IMAGES FROM TAPE ####
MAKE DC C'MAKE' PUT CARD IMAGES ON TAPE ####
 DC C'OUTP' TAPE BLOCKING SUBROUTINE OUTPUT
EJECT1 DC C'PAGE' SPACE PRINTER ONE PAGE
 DC C'PEF ' POSITION TAPE ## AT ENF-OF-FILE
DPRINT DC C'PRIN' PRINTER DUMP ADR=ADR (FULL WORD)
PUNCH DC C'PUNC' PUNCH DUMP ADR=ADR (FULL WORD)
SCOPE DC C'SCOP' CONTINUOUSLY ISSUE CCW #1 /SIO
DISC DC C'SIO ' ISSUE UP TO 16 CCW CHAINS TO SEL
DUMPT DC C'TDUM' DUMP BLOCKS ONTO TAPE
 DC C'TEST' INPUT TABLES FOR SIO FROM TAPE
READT DC C'TREA' READ BLOCKS FROM TAPE
 DC C'TRW ' REWIND TAPE ##
UTS DC C'UTS ' IF DISC..LOAD IN UTS ROUTINE

* SERVICE ROUTINE PARAMATER REQUESTS

BCWS DC C'BCW ' MPX=BCW = ONNN (NNNN# OF BYTES)
BGNS DC C'BGN ' STARTING ADDRESS IN MEMORY
FINIS DC C'END ' ENDING ADDRESS IN MEMORY
DMSG DC C'DATA' ENTER DATA FROM CONSOLE
ITEMSG DC C'ITEM' TYPE IN ITEM #### TO CHANGE
RACK DC C'IDLE' NO REQUEST CURRENTLY IN PROCESS
PRMS DC C'PRM ' TYPE-IN REQUEST IDENTIFIER
WAIT DC C'BCT=' TYPE IN WAIT-COUNT BEFORE NXT IO

```

0004C0 C2C3E64D  
 0004C4 C2C7D54D  
 0004C8 C5D5C44D  
 0004CC C4C1E3C1  
 0004D0 C9E3C5D4  
 0004D4 C9C4D3C5  
 0004D8 D7D9D44D  
 0004DC C2C3E37E

| 0004E0 | E6C8C1E3     | WHAT   | DC    | C'WHAT'    | UNKNOWN REQUEST TYPE          |
|--------|--------------|--------|-------|------------|-------------------------------|
|        |              |        | EJECT |            |                               |
| 0004E4 | 45 A 0 C 73A | RUN    | BAL   | B10,FEEDRN | LINE FEED/CARRIAGE RETURN     |
| 0004E8 | 45 A 0 C 73A |        | BAL   | B10,FEEDRN | LINE FEED/CARRIAGE RETURN     |
| 0004EC | 41 1 0 C 4D8 |        | LA    | R1,PRMS    | CONSOLE MESSAGE ...PRM        |
| 0004F0 | 45 A 0 C 1E0 |        | BAL   | B10,MSG4   | PRINT MSG                     |
| 0004F4 | 45 A 0 C 74A |        | BAL   | B10,GETFD  | GET 4-BYTE REQUEST IDENTIFIER |
| 0004F8 | 45 A 0 C 73A |        | BAL   | B10,FEEDRN | LINE FEED                     |
| 0004FC | 41 1 0 C 450 |        | LA    | R1,BTYPE   | PRINT BUFFER                  |
| 000500 | 41 2 0 C 534 |        | LA    | R2,JTABLE  | ROUTINE ADR.                  |
| 000504 | 58 3 0 0 EAD |        | L     | R3,INPUT   | INPUT CHRS.                   |
| 000508 | 41 F 0 0 01C |        | LA    | R15,28     | NUMBER OF SERVICE ROUTINES    |
| 00050C | 48 4 0 2 000 | LOOKUP | LH    | R4,0(,R2)  | GET ROUTINE ADR               |
| 000510 | 55 3 0 1 000 |        | CL    | R3,0(,R1)  | INPUT = BUFFER ?              |
| 000514 | 47 8 0 4 000 |        | BC    | 8,0(,R4)   | IF EQL, RUN ROUTINE           |
| 000518 | 41 1 0 1 004 |        | LA    | R1,4(,R1)  | NOT EQL, INC. BUFFER          |
| 00051C | 41 2 0 2 002 |        | LA    | R2,2(,R2)  | INCREMENT ROUTINE ADR         |
| 000520 | 46 F 0 C 50C |        | BCT   | R15,LOOKUP | LOOK AT ALL 20 ROUTINES       |
| 000524 | 41 1 0 C 4E0 |        | LA    | R1,WHAT    | NONE EQL INPUT.               |
| 000528 | 45 A 0 C 1E0 |        | BAL   | B10,MSG4   | PRINT CONSOLE MSG; ...WHAT    |
| 00052C | 45 A 0 C 73A |        | BAL   | B10,FEEDRN | SPACE CONSOLE PRINTER         |
| 000530 | 47 F 0 C 4E4 |        | BC    | 15,RUN     | TRY FOR REQUEST, AGAIN.       |

[illegible]

SERVICE ROUTINE ADDRESSES ARE TABLED BELOW

|             |         |        |               |
|-------------|---------|--------|---------------|
| Y (LOADCN)  | JUMP IF | BTYPE  | TYPE IN DATA  |
| Y (PCODE)   | JUMP IF | CODE   | LOAD-CODE     |
| Y (CONTEST) | JUMP IF | CON    | CONSOLE TEST  |
| Y (TCOPY)   | JUMP IF | COPY   | COPY TAPE     |
| Y (CPLR)    | JUMP IF | CSPL   | COMPILER      |
| Y (MDTB)    | JUMP IF | DISC   | BUILD DISC    |
| Y (CONDMF)  | JUMP IF | DUMP   | DUMP/CONSOLE  |
| Y (EBCDIC)  | JUMP IF | EBCDIC | EBCDIC DATA   |
| Y (TEDIT)   | JUMP IF | EDIT   | EDIT CARD     |
| Y (EDUMP)   | JUMP IF | EDUMP  | EBCD-TAPE     |
| Y (WRTEOF)  | JUMP IF | EOF    | WRITE EOF     |
| Y (BEGIN)   | JUMP IF | IDLE   | GO TO IDLE    |
| Y (BLOKIN)  | JUMP IF | INPUT  | INPUT BLOCK   |
| Y (XQT)     | JUMP IF | JUMP   | JUMP TO ADR   |
| Y (TLIST)   | JUMP IF | LIST   | LIST CARDS    |
| Y (THAKE)   | JUMP IF | MAKE   | CARDS-TAPE    |
| Y (BLKOUT)  | JUMP IF | OUTPUT | OUTPUT BLOCK  |
| Y (PAGES)   | JUMP IF | PAGE   | SPACE PRINTR  |
| Y (PEF)     | JUMP IF | PEF    | POSITION TAPE |
| Y (PDUMP)   | JUMP IF | PRINT  | PRINTER DUMP  |
| Y (CDUMP)   | JUMP IF | PUNCH  | PUNCH DUMP    |
| Y (SCOPED)  | JUMP IF | SCOPE  | CCW ISSUE     |
| Y (PRESIO)  | JUMP IF | SIO    | ISSUE 16 CCW  |
| Y (TDUMP)   | JUMP IF | TDUMP  | TAPE DUMP     |
| Y (TEST)    | JUMP IF | TEST   | INPUT TABLE   |
| Y (TREAD)   | JUMP IF | TREAD  | TAPE INPUT    |
| Y (TRW)     | JUMP IF | TRW    | TAPE REWIND   |
| Y (UTSLOD)  | JUMP IF | UTS    | LOAD UTS      |

• • •

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00056C 58 E 0 C 034
000570 41 9 0 C 108
000574 47 F 0 C 58C
000578 58 E 0 C 024
00057C 41 9 0 C 188
000580 47 F 0 C 58C
000584 58 E 0 C 004
000588 41 9 0 C 184
00058C 41 1 0 C 4C4
000590 45 A 0 C 1E0
000594 45 A 0 C 760
000598 18 7 4
00059A 45 A 0 C 864
00059E 41 1 0 C 4C8
0005A2 45 A 0 C 1E0
0005A6 45 A 0 C 760
0005AA 18 8 4
0005AC 45 A 0 C 73A
0005B0 45 A 0 C 73A
0005B4 41 0 0 0 036
0005B8 50 0 0 C 054
0005BC 17 3 3
0005BE 45 B 0 C 2A8
0005C2 98 0 1 9 000
0005C6 45 B 0 C 200
0005CA 55 E 0 C 034
0005CE 47 7 0 C 5E6
0005D2 58 1 0 C 054
0005D6 46 1 0 C 5E2
0005DA 45 A 0 C 856
0005DE 41 1 0 0 036
0005E2 50 1 0 C 054
0005E6 19 7 8
0005E8 47 C 0 C 5BC
0005EC 45 A 0 C 67A
0005F0 55 E 0 C 034
0005F4 47 7 0 C 41C
0005F8 45 A 0 C 856
0005FC 47 F 0 C 606

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```

EJECT
PDUMP L R14,HSPDVN
LA R9,PRINTX
BC 15,COND1
CDUMP L R14,PNCHDN
LA R9,PNCHXX
BC 15,COND1
CONDMP L R14,CONSOLE
CONDO LA R9,PACK6
CONDI LA R1,BGNS
BAL B10,MSG4
BAL B10,GET4HX
LR R7,R4
BAL B10,SPACEX
LA R1,FINIS
BAL B10,MSG4
BAL B10,GET4HX
LR R8,R4
BAL B10,FEEDRN
BAL B10,FEEDRN
LA R13,54
ST R13,LINENR
DUMP2 XR R3,R3
BAL B11,TRANS
LM R0,R1,0(R9)
BAL B11,SIOXX
CL R14,HSPDVN
BC NEQ,NOSKIP
L R1,LINENR
BCT R1,STLINE
BAL B10,MARGIN
LA R1,54
STLINE ST R1,LINENR
NOSKIP CR R7,R8
BC OPILE,DUMP2
BAL B10,PAGE
CL R14,HSPDVN
BC NEQ,BEGIN
BAL B10,MARGIN
BC 15,PAGES
• NOTE
• NOTE
• NOTE

```

```

PRINTER DUMP
I/O PACKET
JOIN DUMP
PUNCH DUMP
I/O PACKET
JOIN DUMP
CONSOLE DUMP
I/O PACKET
DUMP ROUTINE BEGINS HERE....
REQUEST DUMP STARTING ADDRESS
GET 4-DIGIT STARTING ADDRESS
SAVE START ADR
SPACE PRINTER.
REQUEST DUMP ENDING ADDRESS
REQUEST DUMP ENDING ADDRESS
GET 4-DIGIT ENDING ADDRESS
SAVE END ADR
SPACE PRINTER
SPACE PRINTER
54 LINES TO A PRINTED PAGE
SAVE LINE-COUNT FOR PRINT PAGE
CLEAR WORKING REGISTER
TRANSLATE HEX TO EBCDIC
PICKUP I/O PACKET FOR EBCDIC
INITIATE I/O TO SELECTED DEVICE
PRINTER DUMP ?
NO.
YES, GET LINE #N
DECREMENT UNTIL ZERO
ZERO. TIME TO SETUP MARGIN AGAIN
54 LINES TO A PRINTED PAGE
SAVE LINE NUMBER
IS CURRENT ADR (R7) = END (R8)
IF NOT GREATER OR EQL, DO MORE
DONE. SPACE PRINTER TO TOP/PAGE
PRINTER DUMP ?
XXXXXXX NO. GO TO IDLE LOOP
SETUP PRINTER MARGINS NOW
YES. SPACE PRINTER 1 MORE PAGE
• THE DUMP ROUTINE DUMPS
• START-END ADDRESSES, INCLUSIVE
• ADDRESSES MUST BE ON A

```

000600 45 A 0 C 760  
000604 07 F 4

```

* NOTE
*
* * FULL-WORD BOUNDARY
* EXECUUE USER SUBROUTINE
* REQUEST ADDRESS OF SUBROUTINE
* DONE...EXIT
XQT BAL B10,GET4HX
 BCR 15,R4
```

```

000606 58 E 0 C 034
00060A 41 F 0 0 042
00060E 45 A 0 C 684
000612 47 F 0 C 41C

000616 98 0 1 C 988
00061A 58 E 0 C 034
00061E 45 B 0 C 200
000622 47 F 0 C 41C

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000626 45 A 0 C 73A
00062A 45 A 0 C 73A
00062E 41 1 0 C 4C4
000632 45 A 0 C 1E0
000636 45 A 0 C 760
00063A 18 8 4
00063C 45 A 0 C 864
000640 41 1 0 C 4CC
000644 45 A 0 C 1E0
000648 45 A 0 C 73A
00064C 45 A 0 C 73A
000650 18 7 8
000652 45 0 0 C 2DA
000656 98 0 1 C 174
00065A 45 B 0 C 200
00065E 41 F 0 0 004
000662 45 A 0 C 788
000666 50 3 0 8 000
00066A 41 8 0 8 004
00066E 45 A 0 C 864
000672 46 F 0 C 662
000676 47 F 0 C 64C

```

## EJECT

```

PAGES L
 LA
 BAL
 BC

PCODE LM
 L
 BAL
 BC

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PRINTER : EJECT ONE PAGE

R14,HSPDVN

R15,66

B10,P1

15,BEGIN

PRINTER : LOAD PRINT-DRUM WITH PROPER CODES

R0,R1,DRUMCD

R14,HSPDVN

B11,SIOXX

15,BEGIN

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PRINTER - HOME PAPER ROUTINE

66 LINES ON A PAGE

GO PRINT 1 PAGE OF BLANKS

RETURN TO IDLE LOOP NOW. DONE

PRINTER : LOAD PRINT-DRUM WITH PROPER CODES

LOAD PRINT-CODES INTO PRINTER

GET PRINTER DEVICE ##

INITIATE I/O TO PRINTER

DONE. EXIT TO IDLE LOOP

DONE. EXIT TO IDLE LOOP

DONE. EXIT TO IDLE LOOP

DONE. EXIT TO IDLE LOOP

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DONE. EXIT TO IDLE LOOP

CONSOLE : TYPE IN DATA TO GO INTO MEMORY

CONSOLE DATA ENTRY VIA \*\* BTYPE \*\* IS TO A

STARTING ADDRESS ON A FULL-WORD BOUNDARY

STARTING ADDRESS ON A FULL-WORD BOUNDARY

STARTING ADDRESS ON A FULL-WORD BOUNDARY

STARTING ADDRESS ON A FULL-WORD BOUNDARY

STARTING ADDRESS ON A FULL-WORD BOUNDARY

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STARTING ADDRESS ON A FULL-WORD BOUNDARY

B10,FEEDRN

B10,FEEDRN

R1,BGNS

B10,MSG4

B10,GET4HX

R8,R4

B10,SPACE

R1,DMSG

B10,MSG4

R10,FEEDRN

R10,FEEDRN

R7,R8

R13,ADRT00

R0,R1,PACK5

B11,SIOXX

R15,4

B10,GET8HX

R3,0(,R8)

R8,4(,R8)

B10,SPACE

R15,LC1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

15,LOAD1

SPACE PRINTER (CONSOLE)

SPACE PRINTER (CONSOLE)

REQUEST STARTING ADDRESS FOR DATA

REQUEST STARTING ADDRESS FOR DATA

GET 4-DIGIT START ADR

SAVE START ADR

SPACE PRINTER

REQUEST DATA ENTRY FROM CONSOLE

REQUEST DATA ENTRY FROM CONSOLE

SPACE PRINTER

SPACE PRINTER

SAVE CURRENT ADDRESS

PRINT CURRENT ADDRESS

CONSOLE I/O PACKET

PRINT ADDRESS

GET 4-FULL WORDS TO A LINE

REQUEST DATA AS 8-DIGIT #####

STORE DATA

NEW ADDRESS

SPACE PRINTER

FINISH LINE OF 4-WORDS

LINE DONE. START NEW LINE

LINE DONE. START NEW LINE

LINE DONE. START NEW LINE

LINE DONE. START NEW LINE

LINE DONE. START NEW LINE

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LINE DONE. START NEW LINE

```

00067A 55 E 0 C 034
00067E 07 7 A
000680 58 F 0 C 054
000684 98 0 2 C 3F4
000688 45 B 0 C 200
00068C 46 F 0 C 684
000690 07 F A
000692 0000
000694 00000002
000698 05001000
00069C 00000001
0006A0 05001000

0006A4 45 A 0 C 73A
0006A8 98 0 2 C 694
0006AC 45 B 0 C 200
0006B0 45 A 0 C 73A
0006B4 45 A 0 C 73A
0006B8 98 0 2 C 69C
0006BC 45 B 0 C 200
0006C0 47 F 0 C 6B4

```

```

EJECT
PAGE CL R14,HSPDVN
BCR 7,B10
L R15,LINENR
P1 LM R0,R2,PSKIP
BAL B11,SIOXX
BCR R15,P1
BCR 15,B10

CTPK1 DC F'00000002'
DC X'05001000'
CTPK2 DC X'00000001'
DC X'05001000'

CONSOLE : TYPE IN DATA FOR CONSOLE TEST (80 CHR) **
CONTST BAL B10,FEEDRN
LM R0,R2,CTPK1
BAL B11,SIOXX
BAL B10,FEEDRN
CONTRX BAL B10,FEEDRN
LM R0,R2,CTPK2
BAL B11,SIOXX
BC 15,CONTRX

```

```

PAGE EJECT ROUTINE
DONE...EXIT
PICKUP # OF LINES LEFT/PAGE
GET PRINTER-SPACE PACKET
ISSUE PRINT CMD TO UNIT
FINISH OUT THE PAGE
DONE NOW EXIT

```

80-BYTES AT ADR 1000

80-BYTES AT ADR 1000

```

PRINT CARRIAGE RETURN/LINE FEED
GET 128 BYTE INPUT FROM CONSOLE
REQUEST INPUT
PRINT CARRIAGE RETURN/LINE FEED
PRINT CARRIAGE RETURN/LINE FEED
GET 128 BYTE-OUTPUT READY
OUTPUT TO CONSOLE
REPEAT OUTPUT PATTERN TILL ATTN

```

|        |              |        |       |              |                                |
|--------|--------------|--------|-------|--------------|--------------------------------|
| 0006C4 | 41 9 0 C 9A0 | TDUMP  | EJECT | R9,TPAKD     | TAPE DUMP PACKET               |
| 0006C8 | 47 F 0 C 600 |        | LA    | 15,TAPE10    |                                |
| 0006CC | 41 9 0 C 9A8 | TREAD  | BC    | R9,TPAKR     | TAPE READ PACKET               |
| 0006D0 | 58 E 0 C 004 | TAPE10 | LA    | R14,CONSOL   |                                |
| 0006D4 | 41 1 0 C 4C4 |        | L     | R1,BGNS      |                                |
| 0006D8 | 45 A 0 C 1E0 |        | LA    | B10,MSG4     |                                |
| 0006DC | 45 A 0 C 760 |        | BAL   | B10,GET4HX   | GET 4-DIGIT NR (START ADR)     |
| 0006E0 | 18 8 4       |        | BAL   | R8,R4        | SAVE IN SUPERVISOR REGISTER 8  |
| 0006E2 | 45 A 0 C 864 |        | LR    | B10,SPACEX   | SPACE CONSOLE PRINTER          |
| 0006E6 | 41 1 0 C 4C0 |        | BAL   | R1,BCWS      |                                |
| 0006EA | 45 A 0 C 1E0 |        | LA    | B10,MSG4     |                                |
| 0006EE | 45 A 0 C 760 |        | BAL   | B10,GET4HX   | GET 4-DIGIT NR (MPX=BCW)       |
| 0006F2 | 89 4 0 0 004 |        | SLL   | R4,4(0)      | SHIFT DATA INTO MPX-BCW FORMAT |
| 0006F6 | 18 7 4       |        | LR    | R7,R4        | SAVE IN SUPERVISOR REGISTER 7  |
| 0006F8 | 45 A 0 C 864 |        | BAL   | B10,SPACEX   | SPACE CONSOLE PRINTER          |
| 0006FC | 98 0 2 C 980 |        | LM    | R0,R2,COMSG  | GET TAPE SERVO NUMBER          |
| 000700 | 45 B 0 C 200 |        | BAL   | B11,S10XX    | SEND COMMAND OUT TO UNIT       |
| 000704 | 45 A 0 C 760 |        | BAL   | B10,GET4HX   | GET SERVO NUMBER               |
| 000708 | 50 4 0 C 044 |        | ST    | R4,TAPENN    | SAVE SERVO ADR                 |
| 00070C | 40 7 0 9 004 |        | STH   | R7,4(,R9)    | STORE BYTE COUNT               |
| 000710 | 40 8 0 9 006 |        | STH   | R8,6(,R9)    | STORE BCW ADDRESS PORTION      |
| 000714 | 45 A 0 C 864 |        | BAL   | B10,SPACEX   | SPACE CONSOLE PRINTER          |
| 000718 | 98 0 2 C 97C |        | LM    | R0,R2,CPYPAK | GET N OF COPIES TO MAKE        |
| 00071C | 45 B 0 C 200 |        | BAL   | B11,S10XX    | REQUEST NR                     |
| 000720 | 45 A 0 C 760 |        | BAL   | B10,GET4HX   | GET 4-DIGIT N                  |
| 000724 | 18 F 4       |        | LR    | R15,R4       | SAVE IN R15                    |
| 000726 | 58 E 0 C 044 | CPYTTT | L     | R14,TAPENN   | GET TAPE SERVO N TO R14        |
| 00072A | 98 0 2 9 000 |        | LM    | R0,R2,0(B9)  |                                |
| 00072E | 45 B 0 C 200 |        | BAL   | B11,S10XX    |                                |
| 000732 | 46 F 0 C 726 |        | BCT   | B15,CPYTTT   | COPY TAPE N TIMES              |
| 000736 | 47 F 0 C 41C |        | BC    | 15,BEGIN     |                                |



|        |              |        |     |             |                                           |
|--------|--------------|--------|-----|-------------|-------------------------------------------|
| 00073A | 98 0 2 C 154 | EJECT  | LM  | RO,R2,PACK3 |                                           |
| 00073E | 55 E 0 C 004 | FEEDRN | CL  | R14,CONSOL  |                                           |
| 000742 | 07 7 A       |        | BCR | 7,B10       | DONE...EXIT                               |
| 000744 | 45 B 0 C 200 |        | BAL | B11,SIOXX   | SEND COMMAND OUT TO UNIT                  |
| 000748 | 07 F A       |        | BCR | 15,B10      | DONE NOW EXIT                             |
| 00074A | 98 0 1 C 134 | GETFD  | LM  | RO,R1,PACK1 | * ROUTINE TO SOLICIT 4-CHR ENTRY *****    |
| 00074E | 58 E 0 C 004 |        | L   | R14,CONSOL  |                                           |
| 000752 | 45 B 0 C 200 |        | BAL | B11,SIOXX   | SEND COMMAND OUT TO UNIT                  |
| 000756 | 17 1 1       |        | XR  | R1,R1       | CLEAR R1                                  |
| 000758 | 18 2 1       |        | LR  | R2,R1       | CLEAR R2                                  |
| 00075A | 50 1 0 0 EA4 |        | ST  | R1,INPUT+4  | CLEAR OUT ANYTHING AFTER 4TH CH           |
| 00075E | 07 F A       |        | BCR | 15,B10      | DONE NOW EXIT                             |
| 000760 | 50 E 0 C 004 | GET4HX | ST  | R14,KIND    | * ROUTINE TO SOLICIT 4-HEX DIGITS *       |
| 000764 | 58 E 0 C 004 |        | L   | R14,CONSOL  | GET INPUT FROM CONS.                      |
| 000768 | 98 0 1 C 134 |        | LM  | RO,R1,PACK1 | REQUEST INPUT                             |
| 00076C | 45 B 0 C 200 |        | BAL | B11,SIOXX   | SEND COMMAND OUT TO UNIT                  |
| 000770 | 17 1 1       |        | XR  | R1,R1       | CLEAR R1                                  |
| 000772 | 50 1 0 0 EA4 |        | ST  | R1,INPUT+4  | CLEAR SIGN, GARBAGE.                      |
| 000776 | 41 1 0 0 EA0 |        | LA  | R1,INPUT    | START ADR OF EBCDIC                       |
| 00077A | 41 2 0 0 E10 |        | LA  | R2,ADR      | BUFFER FOR HEX EQUIV.                     |
| 00077E | 45 B 0 C 32C |        | BAL | B11,CONVRT  | EBCDIC TO HEX                             |
| 000782 | 58 E 0 C 004 |        | L   | R14,KIND    | RESTORE OLD DEVICE ADDRESS                |
| 000786 | 07 F A       |        | BCR | 15,B10      | DONE NOW EXIT                             |
| 000788 | 50 E 0 C 004 | GET8HX | ST  | R14,KIND    | * ROUTINE TO SOLICIT 8-HEX DIGITS ENTRY * |
| 00078C | 58 E 0 C 004 |        | L   | R14,CONSOL  | ENTRY FROM CONSOLE                        |
| 000790 | 98 0 2 C 144 |        | LM  | RO,R2,PACK2 | GET REQUEST PACKET                        |
| 000794 | 45 B 0 C 200 |        | BAL | B11,SIOXX   | SEND COMMAND OUT TO UNIT                  |
| 000798 | 58 1 0 C 0E4 |        | L   | R1,DONE     |                                           |
| 00079C | 55 1 0 0 EAC |        | CL  | R1,INPUT+12 |                                           |
| 0007A0 | 47 8 0 C 626 |        | BC  | EQL,TYPE    | IF 'DONE' RETURN TO BTYPE/NEW ADR         |
| 0007A4 | 17 1 1       |        | XR  | R1,R1       | CLEAR R1                                  |
| 0007A6 | 50 1 0 0 EB4 |        | ST  | R1,INPUT+20 | CLEAR SIGN, GARBAGE                       |
| 0007AA | 41 1 0 0 EAC |        | LA  | R1,INPUT+12 | START ADR FOR 8-BYTE CONVERSION           |
| 0007AE | 41 2 0 0 E48 |        | LA  | R2,DATA     | BUFFER FOR 8-DIGIT HEX RESULT             |
| 0007B2 | 45 B 0 C 32C |        | BAL | B11,CONVRT  | CONVERT EBCDIC TO HEX                     |
| 0007B6 | 58 E 0 C 004 |        | L   | R14,KIND    | RESTORE OLD DEVICE ADDRESS                |
| 0007BA | 07 F A       |        | BCR | 15,B10      | DONE NOW EXIT                             |

## EJECT

SIO ROUTINE :

THE FOLLOWING ROUTINE (THIS PAGE) IS  
USED TO TABLE SELECTOR CHANNEL I/O INFORMATION  
IN THE FOLLOWING FORMAT :

NNNNNNNN = WAIT COUNT

DVNTBL (ENTRY) = DEVICE #,CCWTLB ADDRESS

CCW ENTRIES ARE TERMINATED BY TYPING IN 00000000 AS CCW  
DEVICE ENTRIES, TERMINATED BY TYPING IN FFFF AS DEVICE  
WHEN FFFF IS TYPED IN AS DEVICE, CCW CHAINS ARE EXECUTED

```
0007BC 58 1 0 C 0A4
0007C0 58 2 0 C OFC
0007C4 90 1 2 C A70
0007C8 45 A 0 C 73A
0007CC 58 E 0 C 004
0007D0 98 0 2 C 1C8
0007D4 45 B 0 C 200
0007D8 45 A 0 C 760
0007DC 55 4 0 C 0B4
0007E0 47 8 0 C 87A
0007E4 58 1 0 C A70
0007E8 40 4 0 1 000
0007EC 58 2 0 C A74
0007F0 40 2 0 1 002
0007F4 41 1 0 C 4DC
0007F8 45 A 0 C 1E0
0007FC 45 A 0 C 788
000800 58 1 0 C A70
000804 50 3 0 1 004
000808 41 1 0 1 008
00080C 50 1 0 C A70
000810 45 A 0 C 73A
000814 45 A 0 C 73A
000818 98 0 2 C 100
00081C 45 B 0 C 200
000820 45 A 0 C 73A
```

```
PRESIO L R1,DVNLOC ADDRESS OF DEVICE NUMBER TABLE
L R2,CCWS ADDRESS OF CCW TABLE
STM R1,R2,DVNIX STORE INTO DEVICE,CCW INDEX POINTERS
DEVICE BAL B10,FEEDRN SEND CARRIAGE RETURN, LINE FEED
L R14,CONSOL
LM R0,R2,DVNPak
BAL B11,SIOXX TYPE IN DEVICE
BAL B10,GET4HX SEND COMMAND OUT TO UNIT
CL R4,HALF GET 4 DIGIT DEVICE NUMBER
BC EQL,XQTSIO IF DEVICE NUMBER IS FFFF THEN RUN THE CCW
L R1,DVNIX RUN ALL CCWS TYPED IN SO FAR
STH R4,0(,R1) PICKUP DEVICE TABLE INDEX
L R2,CCWIX STORE DEVICE NUMBER IN TABLE, TOP 2 BYTES
STH R2,2(,R1) PICKUP CCW TABLE INDEX POINTER
LA R1,WAIT STORE CCW ADDRESS IN DEVICE TABLE
BAL B10,MSG4 SETUP CONSOLE MESSAGE/WAIT COUNT
BAL B10,GET8HX REQUEST BCT-COUNT = WAIT/CCW SIO
L R1,DVNIX GET 8-DIGIT BCT COUNT FROM CONS.
ST R3,4(,R1) GET DEVICE-TABLE ADDRESS AGAIN
LA R1,8(,R1) TABLE WAIT-COUNT FOR XQTSIO USE
ST R1,DVNIX INCREMENT DEVICE TABLE POINTER FOR NEXT
BAL B10,FEEDRN SAVE POINTER VALUE IN DVNIX
BAL B10,FEEDRN SEND CARRIAGE RETURN,
LM R0,R2,CCWPAK SEND CARRIAGE RETURN,
BAL B11,SIOXX CONSOLE MSG., TYPE IN CCWS<
BAL B10,FEEDRN SEND COMMAND OUT TO UNIT
LINE=FEED / CARRIAGE RETURN
```

|        |              |        |     |                                |                                           |
|--------|--------------|--------|-----|--------------------------------|-------------------------------------------|
| 000824 | 45 A 0 C 788 | EJECT  | BAL | B10,GET8HX                     | GET FIRST 8 DIGIT HALF OF CCW             |
| 000828 | 12 3 3       | NEWCCW | LTR | R3,R3                          | TEST INPUT DIGITS FOR 00000000            |
| 00082A | 47 8 0 C 7C8 |        | BC  | ZERO,DEVICE                    | INPUT CCW WAS ZERO..GET NEW DEVICE NUMBER |
| 00082E | 58 1 0 C A74 |        | L   | R1,CCWIX                       | GET CCW TABLE POINTER                     |
| 000832 | 50 3 0 1 000 |        | ST  | R3,0(,R1)                      | STORE CCW IN CCW TABLE                    |
| 000836 | 45 A 0 C 864 |        | BAL | B10,SPACEX                     | SPACE CONSOLE PRINTER                     |
| 00083A | 45 A 0 C 788 |        | BAL | B10,GET8HX                     | GET 8 DIGIT HALF OF CCW TO COMPLETE IT    |
| 00083E | 58 1 0 C A74 |        | L   | R1,CCWIX                       | PICKUP CCW TABLE INDEX AGAIN              |
| 000842 | 50 3 0 1 004 |        | ST  | R3,4(,R1)                      | STORE REST OF CCW IN TABLE                |
| 000846 | 41 1 0 1 008 |        | LA  | R1,8(,R1)                      | INCREMENT CCW TABLE POINTER FOR NEXT ONE  |
| 00084A | 50 1 0 C A74 |        | ST  | R1,CCWIX                       | SAVE POINTER VALUE IN CCWIX               |
| 00084E | 45 A 0 C 73A |        | BAL | B10,FEEDRN                     | SEND CARRIAGE RETURN, LINE FEED TO CONSOL |
| 000852 | 47 F 0 C 824 |        | BC  | UNCOND,NEWCCW                  | GO GET MORE CCWS FROM CONSOLE INPUT       |
| 000856 | 55 E 0 C 034 | *****  |     | PRINTER MARGIN CONTROL ROUTINE |                                           |
| 00085A | 07 7 A       | MARGIN | CL  | R14,HSPDVN                     | IS PRINTER IN USE ?                       |
| 00085C | 41 F 0 C 00D |        | BCR | 7,B10                          | EXIT IF NOT PRINTER                       |
| 000860 | 47 F 0 C 684 |        | LA  | R15,13(0,R12)                  | PICKUP 13 LINE MARGIN                     |
|        |              |        | BC  | 15,P1                          | CALL PRINTER-SPACE SUBROUTINE             |
| 000864 | 50 E 0 C 0D4 | *****  |     | CONSOLE-PRINTER SPACE ROUTINE  |                                           |
| 000868 | 58 E 0 C 004 | SPACEX | ST  | R14,KIND                       | SAVE CURRENT DEVICE ADDRESS               |
| 00086C | 98 0 1 C 164 |        | L   | R14,CONSOL                     |                                           |
| 000870 | 45 B 0 C 200 |        | LM  | R0,R1,PACK4                    | PICKUP CONSOLE SPACE PACKET               |
| 000874 | 58 E 0 C 0D4 |        | BAL | R11,SIOXX                      | SPACE CONSOLE PRINTER                     |
| 000878 | 07 F A       |        | L   | R14,KIND                       | RESTORE INCOMING DEVICE ADR               |
|        |              |        | BCR | 15,R10                         | EXIT FROM CONS-SPACE ROUTINE              |

00087A 58 8 0 C 0A4  
 00087E 48 E 0 8 000  
 000882 54 E 0 C 0B4  
 000886 48 6 0 8 002  
 00088A 58 1 0 8 004  
 00088E 41 8 0 8 008  
 000892 54 6 0 C 0B4  
 000896 12 6 6

000898 47 8 0 C 41C  
 00089C 45 8 0 C 8A4  
 0008A0 47 F 0 C 87E

0008A4 80 00 C 128  
 0008A8 48 D 0 C 9B4  
 0008AC 54 D 0 0 0E0  
 0008B0 47 7 0 C 8BC  
 0008B4 41 F 0 0 008  
 0008B8 47 F 0 C 8BE  
 0008BC 17 F F  
 0008BE 98 3 4 C 128  
 0008C2 90 3 4 0 008  
 0008C6 90 3 4 0 0E8  
 0008CA 40 6 0 0 002  
 0008CE 46 1 0 C 8CE

0008D2 9C 00 E 000  
 0008D6 47 8 0 C 8D6

## EJECT

## SELECTOR CHANNEL CHECKOUT AIDS

THIS ROUTINE EXECUTES CCW CHAINS ENTERED BY SIO

XQTSIO L R8,DVNLOC GET DEVICE-NUMBER=TABLE ADDRESS  
 SIOS LH R14,0(,R8) GET DEVICE NUMBER FROM TABLE  
 N R14,HALF AND OUT ANY SIGN EXTENSION  
 LH R6,2(,R8) PICK UP CCW ADDRESS FROM TABLE  
 L R1,4(,R8) PICKUP WAIT COUNT FROM TABLE  
 LA R8,8(,R8) INCREMENT TABLE POINTER  
 N R6,HALF AND OUT ANY SIGN EXTENSION  
 LTR R6,R6 CHECK FOR CCW ADDRESS EQL 00000000

CHANGE THE BRANCH ADDRESS TO ..XQTSIO FOR CYCLING ALL CHAINS

BC ZERO,BEGIN CCW ADR WAS ZERO..EXIT  
 BAL B11,SELSIO START I/O ON SELECTOR CHANNEL 1  
 BC 15,SIOS GO BACK AND GET MORE DEVICE NUMBERS

THIS IS THE SELECTOR CHANNEL I/O ROUTINE

USED BY DISC/SIO/SCOPE SERVICE ROUTINES

SELSIO SSM SELPSW SET NEW SYSTEM MASK  
 LM R13,COMSG+4 GET CONSTANT = 100 INTO R13  
 N R13,S14ABS AND WITH CHANNEL,DEVICE  
 BC 7,SEL110 BRANCH IF SELECTOR CHANNEL 1  
 LA R15,8 SET BIAS FOR SELECTOR CH 2  
 BC 15,SEL10 EXECUTE CCWS  
 SEL110 XR R15,R15 CLEAR BIAS FOR SELECTOR CH I/O  
 SEL10 LM R3,R4,SELPSW PICKUP NEW SELECTOR CHANNEL 1 PSW  
 STM R3,R4,NS1PSW STORE IN NEW PSW LOCATION  
 STM R3,R4,NS2PSW STORE NEW SELECTOR CH 2 PSW  
 STH R6,SDABS+2 SET CCW ADDRESS IN CAW  
 BCT R1,\* WAIT DESIRED TIME, THEN START UP

BREAKPOINT ADDRESS FOR HALT BEFORE CCW CHAIN IS EXECUTED

SIO X'0'(R14) START I/O.. DEVICE NUMBER IS IN R14  
 BC ZERO,\* WAIT FOR SOME INTERRUPT FROM CHANNEL

|                                            |        |       |           |                                                 |                                   |  |
|--------------------------------------------|--------|-------|-----------|-------------------------------------------------|-----------------------------------|--|
|                                            |        |       |           | EJECT                                           |                                   |  |
| 0008DA                                     | 91 02  | F 1A4 | *****     | STATUS CHECKING FOR ALL CCWS                    | *****                             |  |
| 0008DE                                     | 47 1 0 | C 908 | DVCEND TM | X'1A4'(R15),X'01'                               | UNIT EXCEPTION STATUS ?           |  |
| 0008E2                                     | 91 02  | F 1A4 | BC        | 1,DVCERR                                        | BRANCH IF ERROR STATUS.           |  |
| 0008E6                                     | 47 1 0 | C 908 | TM        | X'1A4'(R15),X'02'                               | UNIT CHECK STATUS ?               |  |
| 0008EA                                     | 91 04  | F 1A4 | BC        | 1,DVCERR                                        | BRANCH IF ERROR STATUS.           |  |
| 0008EE                                     | 07 1 8 |       | TM        | X'1A4'(R15),X'04'                               | DEVICE END STATUS ?               |  |
| 0008F0                                     | 91 80  | 0 1A4 | BCR       | 1,B11                                           | DEVICE END...EXIT                 |  |
| 0008F4                                     | 47 1 0 | C A78 | TM        | X'1A4'(000),X'80'                               | ATTENTION ? SEL 1                 |  |
| 0008F8                                     | 91 80  | 0 1AC | BC        | 1,ATNSL1                                        | BRANCH IF ATTENTION               |  |
| 0008FC                                     | 47 1 0 | C 1FC | TM        | X'1AC'(000),X'80'                               | ATTENTION ? SEL 2                 |  |
| 000900                                     | 91 08  | F 1A4 | BC        | 1,ATNSL2                                        | BRANCH IF ATTENTION               |  |
| 000904                                     | 47 1 0 | C 8DA | TM        | X'1A4'(R15),X'08'                               | CHANNEL END ?                     |  |
|                                            |        |       | BC        | 1,DVCEND                                        | CHANNEL END...WAIT FOR DEVICE END |  |
| 000908                                     | 58 1 0 | 0 0C0 | *****     | STATUS ERROR DETECTED IN CSW FOR LAST CCW CHAIN | ..                                |  |
| 00090C                                     | 43 1 0 | F 1A4 | DVCERR L  | R1,S12ABS                                       | CLEAR R1                          |  |
| 000910                                     | 99 00  | 1 000 | IC        | R1,420(,R15)                                    | PICKUP CHANNEL STATUS WORD        |  |
| 000914                                     | 47 F 0 | C 41C | HPR       | 0(R1)                                           | DISPLAY STATUS                    |  |
|                                            |        |       | BC        | 15,BEGIN                                        |                                   |  |
| *****                                      |        |       |           |                                                 |                                   |  |
| * CYCLE ON FIRST CCW CHAIN FOR SIO ROUTINE |        |       |           |                                                 |                                   |  |
| *****                                      |        |       |           |                                                 |                                   |  |
| 000918                                     | 58 8 0 | C 0A4 | SCOPED L  | R8,DVNLOC                                       | GET DEVICE=NUMBER=TABLE ADDRESS   |  |
| 00091C                                     | 48 E 0 | 8 000 | LH        | R14,0(,R8)                                      | GET DEVICE NUMBER FROM TABLE      |  |
| 000920                                     | 54 E 0 | C 0B4 | N         | R14,HALF                                        | AND-OUT ANY SIGN EXTENSION        |  |
| 000924                                     | 48 6 0 | 8 002 | LH        | R6,2(,R8)                                       | GET CCW ADDRESS FROM TABLE        |  |
| 000928                                     | 54 6 0 | C 0B4 | N         | R6,HALF                                         | AND-OUT ANY SIGN EXTENSION        |  |
| 00092C                                     | 58 1 0 | 8 004 | L         | R1,4(,R8)                                       | PICKUP WAIT COUNT BEFORE ISSUE    |  |
| 000930                                     | 45 8 0 | C 8A4 | BAL       | B11,SELSIO                                      | SEND THE START IO OUT             |  |
| 000934                                     | 47 F 0 | C 918 | BC        | 15,SCOPED                                       | RE-ISSUE SAME CHAIN               |  |

```

000938 41 1 0 C 15C
00093C 45 A 0 C 1E0
000940 45 A 0 C 760
000944 50 4 0 0 EE0
000948 45 A 0 C 864
00094C 41 1 0 C 16C
000950 45 A 0 C 1E0
000954 45 A 0 C 760
000958 50 4 0 0 EE4
00095C 07 F F

```

```

00095E 98 1 6 C 988
000962 90 1 2 0 FE8
000966 90 3 4 0 F00
00096A 90 5 6 C C28
00096E 80 00 C 128
000972 41 0 0 C C08
000976 47 F 0 0 F00
00097A 0000
00097C 00000001
000980 00C0
000982 09E4
000984 0700 0700
000988 00020000
00098C 01000000
000990 9C00
000992 0130
000994 47F00F04
000998 06000000
00099C 00000E10

```

## EJECT

\*\*\*\*\*

```

CYLTRK LA
BAL
BAL
ST
BAL
LA
BAL
BAL
ST
BCR

```

\*\*\*\*\*

```

UTSLOD LM
STM
STM
STM
SSM
LA
BC

```

CPYPAK

```

DC
DC
DC
CNOP 0,8

```

UTSBUF

```

DC
DC
DC
DC
DC
DC
DC

```

```

REQUEST CYLINDER/TRACK ##### FOR DISC SERVICE
R1,CYLMS SEND REQUEST FOR CYLINDER TO USE
B10,MSG4 PRINT MSG ON CONSOLE
B10,GET4HX GET 4-DIGIT CYLINDER NUMBER
R4,CYLNUM SAVE NUMBER
B10,SPACEX SPACE CONSOLE PRINTER
R1,TRKMS REQUEST TRACK NUMBER TO USE
B10,MSG4 PRINT MSG ON CONSOLE
B10,GET4HX GET 4-DIGIT TRACK NUMBER
R4,TRKNUM SAVE NUMBER
15,R15 DONE...EXIT
DISC LOADER ROUTINE FOR UTS (CYL 02, TRACK 00)
R1,R6,UTSBUF SETUP UTS LOAD
R1,R2,SRHADR SAVE CYL/TRK/RECORD
R3,R4,3840 STORE START I/O , WAIT LOOP
R5,R6,T2D10 STORE CCW
SELPSW ALLOW SELECTOR CHANNEL INTERRUPT
R0,T2DISC SET CCW ADDRESSES IN CAW
15,3840 LOAD UTS

```

```

F'1'
X'00C0'
Y(CPYMSG)
X'00020000'
X'01000000'
X'9C00'
Y(D8411)
X'47F00F04'
X'06000000'
X'00000E10'

```

```

CYLINDER 02, TRACK 00
RECORD 01
*** NOTE START I/O IS FOR DISC
*** NOTE START I/O IS FOR DISC
*** SIO AND WAIT LOOP ARE STORED AT 0F00
DISC READ COMMAND..LOW 2 BYTES = ADDRESS
NO CHAINING...RECORD IS 3600 BYTES LONG

```

|        |                   |         |       |    |                           |                               |
|--------|-------------------|---------|-------|----|---------------------------|-------------------------------|
| 0009A0 | 00000001          | TPAKD   | EJECT | DC | F'1'                      |                               |
| 0009A4 | 0000              |         |       | DC | X'0000'                   |                               |
| 0009A6 | 09A0              |         |       | DC | Y(TPAKD)                  |                               |
| 0009A8 | 00000002          | TPAKR   |       | DC | F'2'                      |                               |
| 0009AC | 0000              |         |       | DC | X'0000'                   |                               |
| 0009AE | 09A8              |         |       | DC | Y(TPAKR)                  |                               |
| 0009B0 | 00000001          | COMSG   |       | DC | F'1'                      | REQUEST TAPE SERVO NUMBER     |
| 0009B4 | 0100              |         |       | DC | X'0100'                   |                               |
| 0009B6 | 09F0              |         |       | DC | Y(SRVBUF)                 |                               |
| 0009B8 | 000000FB          | DRUMCD  |       | DC | X'000000FB'               |                               |
| 0009BC | 0400              |         |       | DC | X'0400'                   |                               |
| 0009BE | 0A30              |         |       | DC | Y(CODES)                  |                               |
| 0009C0 | F9F4F0F0 40E2C5D9 | SERVE   |       | DC | C'9400 SERVICE ROUTINES : | LEVEL 2.00 ' TITLE            |
| 0009E4 | 7B40C2D3 D6C3D2E2 | CPYMSG  |       | DC | C'# BLOCKS = ' :          | REQUEST NUMBER OF TAPE-BLOCKS |
| 0009F0 | E3E8D7C5 40C9D540 | SRVBUF  |       | DC | C'TYPE IN SERVO # :       |                               |
| 000A00 | E3E8D7C5 40C9D540 | CCWMSG  |       | DC | C'TYPE IN CCW(S) :        |                               |
| 000A10 | E3E8D7C5 40C9D540 | DVCMMSG |       | DC | C'TYPE IN DEVICE :        |                               |

|        |                   |       |       |    |                               |                                |
|--------|-------------------|-------|-------|----|-------------------------------|--------------------------------|
| 000A20 | F0F1F2F3 F4F5F6F7 | TABLE | EJECT | DC | C'0123456789ABCDEF'           | • TRANSLATE TABLE EBCDIC = HEX |
| 000A30 | 50                | CODES | DC    | DC | X'50'                         |                                |
| 000A31 | E9D2D1D8 E7E5E6E8 |       | DC    | DC | C'ZKJQXVWYPGBUMCDLFHSROANITE' | PRINT DRUM                     |
| 000A4B | 4B6B6D            |       | DC    | DC | X'4B6B6D'                     |                                |
| 000A4E | F0F1F2F3 F4F5F6F7 |       | DC    | DC | C'0123456789'                 |                                |
| 000A58 | 5C614E5B 4D5D7E7D |       | DC    | DC | X'5C614E5B4D5D7E7D'           |                                |
| 000A60 | 6E4C5E7A          |       | DC    | DC | C'><::'                       |                                |
| 000A64 | 4A4F5F6D 7F5A6F61 |       | DC    | DC | X'4A4F5F6D7F5A6F616C7B7C40'   |                                |



000A70 00000000  
000A74 00000000

EJECT  
CNOP

0,8

ALIGN ON DOUBLE-WORD BOUNDARY

.....  
\*  
\* DVNIX POINTS TO NEXT DEVICE # ENTRY; CCWIX TO NEXT CCW ENTRY \*  
\*  
.....

DVNIX DC F'0'  
CCWIX DC F'0'

.....  
\*  
\* THE DEVICE NUMBER TABLE BELOW KEEPS DATA FOR THE SJO SUBROUTINE \*  
\* DATA IS KEPT IN THE FOLLOWING FORMAT FOR EACH DEVICE TO CHECK \*  
\*  
.....

(DEVICE NUMBER, STARTING CCW ADDRESS) (WAIT COUNT BEFORE I/O)

FOR EXAMPLE: AN ENTRY FOR DEVICE 0130 MIGHT LOOK LIKE BELOW...  
01305000 00000032 (CCWS AT 5000) (USE BCT OF 30)

NOTE THAT THE BCT COUNT IS EXHAUSTED BEFORE ANY I/O FOR A GIVEN  
CCW CHAIN IS ISSUED TO THE CHANNEL. THE MINIMUM COUNT THEREFORE  
SHOULD BE A VALUE OF 00000001, AND NOT THE MAXIMUM OF 00000000

000A78 82 00 0 058

.....  
\*  
\* ATNSLI LPSW OSIPSW \*  
\*  
.....

RETURN TO PRE-INTERRUPT ADDRESS

000A7C 00000002  
 000A80 05000000  
 000A84 00000009  
 000A88 05000000

000A8C 58 E 0 C 004  
 000A90 50 1 0 0 E20  
 000A94 98 0 1 C 980  
 000A98 45 B 0 C 200  
 000A9C 45 A 0 C 760  
 000AA0 50 4 0 C 044  
 000AA4 45 A 0 C 864  
 000AA8 58 4 0 C 044  
 000AAC 58 1 0 0 E20  
 000AB0 07 F 1

000AB2 45 1 0 C A8C  
 000AB6 41 0 0 0 036  
 000ABA 50 0 0 C 054  
 000ABE 50 C 0 C 064  
 000AC2 D2 03 C F04 C 294  
 000AC8 98 0 1 C B4C  
 000ACC 58 E 0 C 044  
 000AD0 45 B 0 C 200  
 000AD4 91 05 D 000  
 000AD8 47 1 0 C CCA  
 000ADC 58 7 0 C 064  
 000AEO 41 7 0 7 001  
 000AE4 50 7 0 C 064  
 000AE8 45 0 0 C 2DA  
 000AEC D2 03 C F00 0 E50  
 000AF2 58 E 0 C 034  
 000AF6 98 0 1 C B54  
 000AFA 45 B 0 C 200  
 000AFE 58 1 0 C 054  
 000B02 46 1 0 C B0E  
 000B06 45 A 0 C 856  
 000B0A 41 1 0 0 036  
 000B0E 50 1 0 C 054  
 000B12 47 F 0 C AC8

## EJECT

TPAKR2 DC  
 DC  
 TPAKP2 DC  
 DC

\*\*\*\*\*  
 TSETUP L  
 ST  
 LM  
 BAL  
 BAL  
 ST  
 BAL  
 L  
 L  
 BCR

\*\*\*\*\*  
 TLIST BAL  
 TL1 LA  
 ST  
 ST  
 MVC  
 TL2 LM  
 L  
 BAL  
 TM  
 BC  
 L  
 LA  
 ST  
 BAL  
 MVC  
 L  
 LM  
 BAL  
 L  
 BCT  
 BAL  
 LA  
 ST  
 BC  
 TL3

F'2'  
 X'05000000'  
 F'9'  
 X'05000000'

GENERAL ROUTINE TO GET TAPE SERVO NUMBER (####) \*  
 R14,CONSOL  
 R1,TSETRX  
 R0,R1,COMSG  
 B11,SIOXX  
 B10,GET4HX  
 R4,TAPENN  
 R10,SPACEX  
 R4,TAPENN  
 R1,TSETRX  
 15,R1  
 PRINT CARD IMAGES FROM TAPE : \*LIST\* SUBROUTINE \*  
 R1,TSETUP  
 R13,54  
 R13,LINENR  
 R12,ITEMXX  
 F04(4,R12),BLANKX  
 R0,R1,TPAKR1  
 R14,TAPENN  
 B11,SIOXX  
 0(R13),X'05'  
 1,TDONE  
 R7,ITEMXX  
 R7,1(,R7)  
 R7,ITEMXX  
 R13,ADRT00  
 F00(4,R12),PRINT  
 R14,HSPDVN  
 R0,R1,TPAKP1  
 B11,SIOXX  
 R1,LINENR  
 R1,TL3  
 R10,MARGIN  
 R1,54  
 R1,LINENR  
 15,TL2  
 \*READ COMMAND (CONSOLE)  
 (80-BYTE INPUT)  
 \*PRINT COMMAND (SEE LIST)  
 (80-BYTE OUTPUT)  
 SETUP I/O FOR CONSOLE  
 SAVE RETURN ADDRESS  
 PICKUP CONSOLE I/O PACKET  
 PRINT MSG ON CONSOLE PRINTER  
 GET 4-DIGIT SERVO NUMBER  
 SAVE SERVO NUMBER  
 SPACE CONSOLE PRINTER  
 GET SERVO NUMBER AGAIN  
 PICKUP RETURN ADDRESS  
 EXIT FROM THIS SUB-SUBROUTINE  
 REQUEST INPUT SERVO NUMBER  
 GET LINE COUNT (54/PAGE)  
 STORE IN RUNNING COUNT  
 CLEAR ITEM NUMBER  
 MOVE BLANKS INTO PRINT AREA  
 GET INPUT PACKET FOR TAPE  
 GET INPUT TAPE DEVICE ####  
 READ-IN AN 80-BYTE BLOCK  
 CHECK FOR AN END-OF-FILE MARK  
 END-OF-FILE CAUSES BRANCH  
 PICKUP ITEM NUMBER  
 INCREMENT BY ONE  
 SAVE NEW ITEM NUMBER  
 CALL SUBROUTINE TO GET ITEM/EBCD  
 MOVE EBCDIC ITEM # TO PRINT BUF  
 GET PRINTER DEVICE ADDRESS  
 GET PRINTER I/O PACKET  
 PRINT ITEM # AND CARD IMAGE  
 PICKUP LINE NUMBER (# LEFT)  
 DECREMENT BY ONE (54 TO 0)  
 BRANCH IF NOT DOWN TO ZERO (TL3)  
 SETUP MARGINS AND NEW LINE #  
 STORE LINE COUNT LEFT /THIS PG  
 GO READ-IN THE NEXT CARD IMAGE

|        |                   | EJECT  |     | MAKE A TAPE COPY OF CARDS ; *MAKE* SUBROUTINE |                                |
|--------|-------------------|--------|-----|-----------------------------------------------|--------------------------------|
| 000B16 | 45 1 0 C A8C      | *****  |     | R1,TSETUP                                     | GET OUTPUT SERVO ****          |
| 000B1A | 58 E 0 C 014      | TMAKE  | BAL | R14,CREADR                                    | SETUP I/O FOR CARD READER      |
| 000B1E | 98 0 1 C B4C      | TM1    | L   | RO,R1,TPAKR1                                  | PICKUP READER I/O PACKET       |
| 000B22 | 45 B 0 C 200      |        | LM  | B11,SIOXX                                     | READ 80-COLUMN CARD            |
| 000B26 | 05 03 0 F08 C B74 |        | BAL | F04+4(4,0),FIN                                | COMPARE TO 1108 FIN CARD       |
| 000B2C | 47 B 0 C CCA      |        | CLC | B,TDONE                                       | BRANCH TO TAPE REWIND IF FIN   |
| 000B30 | 58 E 0 C 034      |        | BC  | R14,HSPDVN                                    | PICKUP PRINTER DEVICE ****     |
| 000B34 | 98 0 1 C B54      |        | L   | RO,R1,TPAKP1                                  | PICKUP PRINTER I/O PACKET.     |
| 000B38 | 45 B 0 C 200      |        | LM  | B11,SIOXX                                     | PRINT THE CARD-IMAGE           |
| 000B3C | 58 E 0 C 044      |        | BAL | R14,TAPENN                                    | PICKUP OUTPUT TAPE DEVICE **** |
| 000B40 | 98 0 1 C B5C      |        | L   | RO,R1,TPAKT1                                  | PICKUP OUTPUT PACKET           |
| 000B44 | 45 B 0 C 200      |        | LM  | B11,SIOXX                                     | WRITE AN 80-BYTE CARD IMAGE    |
| 000B48 | 47 F 0 C B1A      |        | BAL | 15,TM1                                        | READ-IN THE NEXT CARD NOW      |
| 000B4C | 00000002          |        | BC  | F'2'                                          | INPUT (READ) COMMAND           |
| 000B50 | 05000F08          | TPAKR1 | DC  | X'05000F08'                                   | 80-BYTES AT F08                |
| 000B54 | 00000009          |        | DC  | F'9'                                          | PRINTER COMMAND: PRINT/FEED    |
| 000B58 | 05800F00          | TPAKP1 | DC  | X'05800F00'                                   | 88-BYTES AT F00                |
| 000B5C | 00000001          |        | DC  | F'1'                                          | OUTPUT (WRITE) COMMAND         |
| 000B60 | 05000F08          | TPAKT1 | DC  | X'05000F08'                                   | 80-BYTES AT F08                |
| 000B64 | 00000002          |        | DC  | F'2'                                          | INPUT (READ) COMMAND           |
| 000B68 | E1001000          | TINPAK | DC  | X'E1001000'                                   | 3600-BYTES AT 1000             |
| 000B6C | 00000001          |        | DC  | F'1'                                          | OUTPUT (WRITE) COMMAND         |
| 000B70 | E1001000          | TOUTPK | DC  | X'E1001000'                                   | 3600-BYTES AT 1000             |
| 000B74 | 7FC6C9D5          | FIN    | DC  | X'7FC6C9D5'                                   | THIS IS AN 1108-TYPE FIN CARD  |
|        | 000864            | SPACES | EQU | SPACEX                                        |                                |

```

000B78 45 F 0 C 938
000B7C 41 1 0 C B98
000B80 47 F 0 C A8C
000B84 95 09 0 EE7
000B88 47 A 0 C BE8
000B8C 58 1 0 0 EE4
000B90 5A 1 0 C B6C
000B94 50 1 0 0 EE4
000B98 98 1 2 0 EEO
 000FE8
000B9C 50 C 0 0 FEC
000BA0 40 1 0 0 FE8
000BA4 40 2 0 0 FEA
000BA8 40 1 0 0 FF8
000BAC 40 2 0 0 FFA
000BB0 58 E 0 C 044
000BB4 98 0 2 C B64
000BB8 45 B 0 C 200
000BBC 91 05 0 000
000BC0 47 1 0 C 41C
000BC4 41 8 0 C C00
000BC8 48 E 0 8 000
000BCC 54 E 0 C 0B4
000BD0 48 6 0 8 002
000BD4 54 6 0 C 0B4
000BD8 58 1 0 8 004
000BDC 45 B 0 C 8A4
000BE0 41 8 0 8 008
000BE4 47 F 0 C B84
000BE8 50 C 0 0 EE4
000BEC 58 1 0 0 EEO
000BF0 5A 1 0 C B6C
000BF4 50 1 0 0 EEO
000BF8 47 F 0 C B98

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## EJECT

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* MASTER TAPE TO MASTER DISC COPY ROUTINE

MDTB BAL B15,CYLTRK GET CYLINDER/TRACK FOR I/O
LA R1,GOTCT RETURN ADDRESS
BC 15,TSETUP REQUEST TAPE SERVO #
MDTB1 CLI TRKNUM+3,9 MAXIMUM TRACK NUMBER ?
BC 10,NEWCYL YES...GET NEW CYLINDER/TRACK 00
L R1,TRKNUM GET TRACK NUMBER
A R1,TOUTPK ADD ONE TO NUMBER
ST R1,TRKNUM SAVE NEW TRACK NUMBER
GOTCT LM R1,R2,CYLNUM R1 = CYLINDER # ; R2 = TRACK #
SRHADR EQU 4072 SEEK/SEARCH ADDRESS FOR DISC I/O
ST R12,X'FEC'(1,0) CLEAR SEARCH BUFFER
STH R1,SRHADR SAVE IN SEARCH ADDRESS
STH R2,SRHADR+2 SAVE IN SEARCH ADDRESS
STH R1,4088 SAVE CYL # IN WRT BUFFER
STH R2,4090 SAVE TRK # IN WRT BUFFER
L R14,TAPENN TAPE DEVICE ADDRESS
LM R0,R2,TINPAK INPUT PACKET
BAL B11,SIOXX READ 3600-BYTE BLOCK FROM TAPE
TM 0(R13),X'05' DID I JUST READ AN END-OF-FILE?
BC 1,BEGIN YES...EXIT.
DTB LA R8,DTB1 START ADDRESS OF CCW TABLE
DTB1 LH R14,0(,R8) DISC DEVICE NUMBER
N R14,HALF AND-OUT ANY SIGN PROPAGATION
LH R6,2(,R8) GET CCW ADDRESS
N R6,HALF AND-OUT ANY SIGN PROPAGATION
L R1,4(,R8) PICKUP DELAY COUNT OF ONE
BAL B11,SELSIO ISSUE CCWS TO CHNL/DEVICE
LA R8,8(,R8) INCREMENT POINTER
BC 15,MDTB1 FINISH ALL TABLE ENTRIES
NEWCYL ST R12,TRKNUM CLEAR TRACK NUMBER
L R1,CYLNUM GET CURRENT CYLINDER NUMBER
A R1,TOUTPK ADD ONE TO #
ST R1,CYLNUM SAVE NEW CYLINDER NUMBER
BC 15,GOTCT REJOIN DISC I/O SETUP

```

|        |           |        |                                                           |              |                    |
|--------|-----------|--------|-----------------------------------------------------------|--------------|--------------------|
| 000BFC | 0700 0700 | EJECT  |                                                           |              |                    |
|        |           | CNOP   | 0,8                                                       |              |                    |
|        |           | *      |                                                           |              |                    |
|        |           | *      | DEVICE AND CCW TABLES FOR THE MASTER DISC BUILDER ROUTINE |              |                    |
|        |           | *      |                                                           |              |                    |
| 000C00 | 0130      | TDTBL  | DC                                                        | Y(D8411)     | DISC DEVICE NUMBER |
| 000C02 | 0C08      |        | DC                                                        | Y(T2DISC)    |                    |
| 000C04 | 00000001  |        | DC                                                        | X'00000001'  |                    |
|        |           |        | CNOP                                                      | 0,8          |                    |
| 000C08 | 13000000  | T2DISC | DC                                                        | X'13000000'  |                    |
| 000C0C | 40000000  |        | DC                                                        | X'40000000'  |                    |
| 000C10 | 0700      |        | DC                                                        | X'0700'      |                    |
| 000C12 | 0FE6      |        | DC                                                        | Y(SRHADR=2)  |                    |
| 000C14 | 40000006  |        | DC                                                        | X'40000006'  |                    |
| 000C18 | 3100      |        | DC                                                        | X'3100'      |                    |
| 000C1A | 0FE8      |        | DC                                                        | Y(SRHADR)    |                    |
| 000C1C | 40000005  |        | DC                                                        | X'40000005'  |                    |
| 000C20 | 0800      |        | DC                                                        | X'0800'      |                    |
| 000C22 | 0C18      |        | DC                                                        | Y(T2DISC+16) |                    |
| 000C24 | 00000000  |        | DC                                                        | X'00000000'  |                    |
| 000C28 | 1D000FF8  | T2D10  | DC                                                        | X'1D000FF8'  |                    |
| 000C2C | 00000E18  |        | DC                                                        | X'00000E18'  |                    |
| 000C30 | 00000000  | DSET   | DC                                                        | 3F'0'        |                    |
|        | 00000000  |        |                                                           |              |                    |
|        | 00000000  |        |                                                           |              |                    |
| 000C3C | 01000E10  |        | DC                                                        | X'01000E10'  |                    |
| 000C40 | 00000007  | TRWPAK | DC                                                        | F'7'         | TAPE REWIND PACKET |
| 000C44 | 00100000  |        | DC                                                        | X'00100000'  | ONE-BYTE BCW COUNT |

```

000C48 58 E 0 C 17C
000C4C 98 0 1 C 694
000C50 45 B 0 C 200
000C54 58 E 0 C 044
000C58 98 0 1 C 69C
000C5C 45 B 0 C 200
000C60 46 F 0 C C48
000C64 07 F A

000C66 98 0 1 C 69C
000C6A 45 B 0 C 200
000C6E 07 F A

000C70 41 1 0 C C78
000C74 47 F 0 C A8C
000C78 50 4 0 C 17C
000C7C 41 1 0 C C84
000C80 47 F 0 C A8C
000C84 45 A 0 C 864
000C88 41 1 0 C 4D0
000C8C 45 A 0 C 1E0
000C90 45 A 0 C 864
000C94 45 A 0 C 760
000C98 46 4 0 C C9C
000C9C 18 F 4
000C9E 45 A 0 C C48
000CA2 58 E 0 C 17C
000CA6 98 0 1 C 694
000CAA 45 B 0 C 200
000CAE 58 E 0 C 004
000CB2 45 A 0 C 73A
000CB6 45 A 0 C C66
000CBA 45 A 0 C 73A
000CBE 98 0 1 C 694
000CC2 45 B 0 C 200
000CC6 47 F 0 C 3A4
000CCA 98 0 1 C C40
000CCE 58 E 0 C 044
000CD2 45 B 0 C 200
000CD6 47 F 0 C 41C

```

## EJECT

\*\*\*\*\*

```

CTIN L
LM
BAL
L
LM
BAL
BCT
BCR

```

\*\*\*\*\*

```

CTOUT LM
BAL
BCR

```

\*\*\*\*\*

```

TEDIT LA
BC
TEDIT1 ST
LA
BC
TEDIT2 BAL
LA
BAL
BAL
BAL
BCT
LR
BAL
L
LM
BAL
L
BAL
BAL
BAL
LM
BAL
BC
TDONE LM
L
INITIO BAL
BC

```

## 80 BYTE INPUT

```

R14,SEGNM
R0,R1,CTPK1
B11,SIOXX
R14,TAPENN
R0,R1,CTPK2
B11,SIOXX
R15,CTIN
15,R10

```

## 80 BYTE OUTPUT

```

R0,R1,CTPK2
B11,SIOXX
15,R10

```

## TAPE (CARD IMAGE)

```

R1,TEDIT1
15,TSETUP
R4,SEGNM
R1,TEDIT2
15,TSETUP
B10,SPACEX
R1,ITEMSG
B10,MSG4
B10,SPACEX
B10,GET4HX
R4,++4
R15,R4
R10,CTIN
R14,SEGNM
R0,R1,CTPK1
B11,SIOXX
R14,CONSOL
B10,FEEDRN
B10,CTOUT
B10,FEEDRN
R0,R1,CTPK1
B11,SIOXX
15,CPYX03
R0,R1,TRWPAK
R14,TAPENN
B11,SIOXX
15,BEGIN

```

## ROUTINE : DEVICE (R14)

```

GET INPUT DEVICE NUMBER
80-BYTE INPUT TO ADR 1000
INITIATE I/O TO DEVICE (R14)
GET OUTPUT DEVICE NUMBER
GET OUTPUT PACKET
COPY INPUT-OUTPUT SERVO
REPEAT COUNT IN R15
EXIT VIA ENTRY REGISTER
ROUTINE : DEVICE (R14)
80-BYTE OUTPUT ROUTINE
INITIATE I/O TO DEVICE (R15)
EXIT VIA ENTRY REGISTER
EDIT ROUTINE
EDIT CARD IMAGES ON TAPE
REQUEST SERVO # TO USE
SAVE SERVO NUMBER
GET OUTPUT SERVO ####
GET OUTPUT SERVO ####
SPACE PRINTER
REQUEST ITEM ## TO INSPECT
PRINT MESSAGE ON CONSOLE
SPACE PRINTER
GET 4-DIGIT ITEM ## TO UPDATE
DECREMENT COUNT BY 1
SAVE ITEM NUMBER
GET IMAGE TO UPDATE
GET INPUT SERVO NUMBER AGAIN
READ 1 BLOCK FORWARDS
INITIATE I/O
PRINT IMAGE IN CONSOLE
SPACE PRINTER
PRINT CARD IMAGE
SPACE PRINTER
GET NEW CARD IMAGE FROM CONSOLE
GET NEW CARD IMAGE FROM CONSOLE
EXIT TO TAPE-COPY ROUTINE
REWIND SERVO
PICKUP TAPE SERVO ##
PRINT ADDRESS
DONE...EXIT TO IDLE LOOP

```

|        |    |   |   |   |     |
|--------|----|---|---|---|-----|
| 000CDA | 58 | E | 0 | C | 004 |
| 000CDE | 98 | 0 | 2 | C | 980 |
| 000CE2 | 45 | B | 0 | C | 200 |
| 000CE6 | 45 | A | 0 | C | 760 |
| 000CEA | 58 | E | 0 | 0 | 040 |
| 000CEE | 98 | 0 | 2 | C | 118 |
| 000CF2 | 45 | B | 0 | C | 200 |
| 000CF6 | 47 | F | 0 | C | 41C |

# EJECT

\*\*\*\*\*

|        |     |
|--------|-----|
| WRTEOF | L   |
|        | LM  |
|        | BAL |
|        | BAL |
|        | L   |
| EOFEOF | LM  |
|        | BAL |
|        | BC  |

|                                 |                     |     |
|---------------------------------|---------------------|-----|
| WRITE END-OF-FILE ON TAPE ##### | !                   | EOF |
| R14,CONSOL                      | REQUEST SERVO #     |     |
| RO,R2,COMSG                     | MESSAGE PACKET      |     |
| B11,SIOXX                       | SEND OUT TO CONSOLE |     |
| B10,GET4HX                      | GET SERVO #         |     |
| R14,S4ABS                       | SET IN R14 FOR I/O  |     |
| RO,R2,EOPAK                     | END-OF-FILE PACKET  |     |
| B11,SIOXX                       | WRITE END-OF-FILE   |     |
| 15,BEGIN                        |                     |     |

```

000CFA 41 I O C D02
000CFE 47 F O C A8C
000D02 58 E O C 044
000D06 98 O I C B4C
000D0A 45 B O C 200
000D0E 91 05 D 000
000D12 47 I O C 41C
000D16 47 F O C D02

```

```

000D1A 41 I O C CCA
000D1E 47 F O C A8C

```

```

000D22 41 I O C D2A
000D26 47 F O C A8C
000D2A 58 E O C 044
000D2E 98 O I C 078
000D32 45 B O C 200
000D36 98 O I C 0F8
000D3A 45 B O C 200
000D3E 47 F O C CCA
000D42 41 I O C 4C4
000D46 45 A O C 1E0
000D4A 45 A O C 760
000D4E 40 4 O C 9AE
000D52 41 I O C 4C0
000D56 45 A O C 1E0
000D5A 45 A O C 760
000D5E 89 4 O O 004
000D62 40 4 O C 9AC
000D66 45 A O C 73A
000D6A 98 O I C 9A8
000D6E 47 F O C CD2

```

## EJECT

```

PEF LA
BC
PEF1 L
LM
BAL
TM
BC
BC

```

```

TRW LA
BC

```

```

TEST LA
BC
TEST1X L
LM
BAL
LM
BAL

```

```

BC
EBCDIC LA
BAL
BAL
STH
LA
BAL
BAL
SLL
STH
BAL
LM
BC

```

```

POSITION TAPE TO END-OF-FILE : PEF
R1,PEF1 RETURN ADDRESS
15,TSETUP GET TAPE SERVO ##
R14,TAPENN GET TAPE DEVICE ##
R0,R1,TPAKR1 INPUT PACKET
B11,SIOXX INITIATE I/O
0(R13),X'05' DID I JUST READ AN END-OF-FILE?
1,BEGIN BRANCH IF EOF READ
15,PEF1 NOT READ YET...LOOK AGAIN
REWIND TAPE #### TO LOAD POINT : TRW
R1,TDONE RETURN ADDRESS FOR REWIND
15,TSETUP GET TAPE SERVO ## TO REWIND
LOAD TABLES FOR SIO FROM TAPE : TEST
R1,TEST1X RETURN ADDRESS FOR TSETUP
15,TSETUP GET SERVO #### FOR TABLES/SIO
R14,TAPENN GET INPUT SERVO #### TO R14
R0,R1,TESTDD INPUT PACKET FOR DEVICE TABLE
B11,SIOXX READ DEVICE TABLE INTO PROGRAM
R0,R1,TESTCC INPUT PACKET FOR CCW TABLE
B11,SIOXX READ CCW TABLE FOR SIO ROUTINE
15,TDONE TABLES ARE IN..REWIND SERVO NOW
R1,BGNS SETUP FOR START-ADR REQ
B10,MSG4 SEND ADR REQUEST TO CONSOLE
B10,GET4HX INPUT 4-DIGIT HEX ADDRESS
R4,TPAKR+6 STORE DATA ADDRESS
R1,BCWS SETUP REQUEST FOR BYTE-COUNT
B10,MSG4 REQUEST BYTE-COUNT FOR DATA
B10,GET4HX REQUEST 4-DIGIT BYTE COUNT
R4,4(0) SHIFT TO FIT IN BCW
R4,TPAKR+4 STORE BYTE COUNT
R10,FEEDRN CARRIAGE RETURN, LINE FEED
R0,R1,TPAKR PICKUP INPUT PACKET
15,INITIO READ DATA INTO ADDRESS NOW

```



## EJECT

TAPE BLOCKING SUBROUTINE BEGINS HERE

000D72 58 F 0 C 17C  
 000D76 58 E 0 C 044  
 000D7A 58 A 0 C 0F4  
 000D7E 40 A 0 0 F0E  
 000D82 98 0 1 0 F08  
 000D86 45 B 0 C 200  
 000D8A 5A A 0 C 064  
 000D8E 46 F 0 C D7E  
 000D92 07 F 7

BLOCK

BL111

BLOCKIN  
 BLOC

BLKOUT

CPLR

L R15,SEGNUM  
 L R14,TAPENN  
 L R10,ONEK  
 STH R10,BPAK11+6  
 LM R0,R1,BPAK11  
 BAL B11,SIOXX  
 A R10,ITEMXX  
 BCT R15,BL111  
 BCR 15,R7

LA R1,2  
 ST R1,BPAK11  
 LA R1,BCWS  
 BAL R10,MSG4  
 BAL R10,GET4HX  
 ST R4,ITEMXX  
 SLL R4,4(0)  
 STH R4,BPAK11+4  
 BAL R10,SPACEX  
 BAL R1,TSETUP  
 BAL R10,SPACEX  
 LM R0,R1,CPYPAK  
 BAL B11,SIOXX  
 BAL R10,GET4HX  
 ST R4,SEGNUM  
 BAL R7,BLOCK  
 BC 15,BEGIN  
 LA R1,1  
 BC 15,BLOCK  
 LA R1,4  
 LA R2,3600  
 ST R1,SEGNUM  
 ST R2,ITEMXX  
 SLL R2,4(0)  
 STH R2,BPAK11+4  
 BAL R1,TSETUP  
 MVI BPAK11+3,X'02'  
 BAL R7,BLOCK  
 L R12,ONEK(,0)

GET # OF BLOCKS  
 GET TAPE DEVICE ADDRESS FOR I/O  
 BLOCKING STARTS AT ADR 1000  
 STORE I/O ADDRESS  
 GET I/O PACKET  
 INITIATE I/O  
 ADD BLOCK LENGTH  
 DECREMENT BLOCK COUNT  
 EXIT WHEN ALL BLOCKS ARE DONE

INPUT BLOCKING FROM HERE  
 STORE I/O CMD IN PKT 1=WRT 2=RD

REQUEST BLOCK LENGTH

STORE BLOCK LENGTH  
 STORE IN PACKET/ITEMXX

SPACE THE CONSOLE  
 REQUEST SERVO NUMBER

REQUEST # OF BLOCKS

SAVE BLOCK COUNT  
 BEGIN BLOCKING DATA  
 EXIT FROM TAPE BLOCKING ROUTINE  
 OUTPUT BLOCKING FROM HERE  
 BRANCH TO BLOCK SUBROUTINE  
 GET BLOCK COUNT FOR COMPILER  
 GET BLOCK LENGTH

STORE BLOCK COUNT  
 STORE BLOCK LENGTH

STORE BYTE COUNT/READ  
 GET SERVO #  
 JAM A READ COMMAND  
 INPUT=BLOCKER CALL: LOAD CSPL  
 GET NEW BASE ADDRESS/COMPILER

000D94 41 1 0 0 002  
 000D98 50 1 0 0 F08  
 000D9C 41 1 0 C 4C0  
 000DA0 45 A 0 C 1E0  
 000DA4 45 A 0 C 760  
 000DA8 50 4 0 C 064  
 000DAC 89 4 0 0 004  
 000DB0 40 4 0 0 F0C  
 000DB4 45 A 0 C 864  
 000DB8 45 1 0 C ABC  
 000DBC 45 A 0 C 864  
 000DC0 98 0 1 C 97C  
 000DC4 45 B 0 C 200  
 000DC8 45 A 0 C 760  
 000DCC 50 4 0 C 17C  
 000DD0 45 7 0 C D72  
 000DD4 47 F 0 C 41C  
 000DD8 41 1 0 0 001  
 000DDC 47 F 0 C D98  
 000DE0 41 1 0 0 004  
 000DE4 41 2 0 0 E10  
 000DE8 50 1 0 C 17C  
 000DEC 50 2 0 C 064  
 000DF0 89 2 0 0 004  
 000DF4 40 2 0 0 F0C  
 000DF8 45 1 0 C ABC  
 000DFC 92 02 0 F0B  
 000E00 45 7 0 C D72  
 000E04 58 C 0 0 0F4

000E08

07 F C  
00041C

BCR  
END

15,R12  
BEGIN

BRANCH TO COMPILER